

SEQUENCE LISTING

<110> OMURA, SATOSHI
 IKEDA, HARUO
 OGASAWARA, YUMIKO

<120> STRAIN BELONGING TO THE GENUS STREPTOMYCES AND BEING
 CAPABLE OF PRODUCING NEMADICTIN AND PROCESS FOR
 PRODUCING NEMADICTIN USING THE STRAIN

<130> 8012-1318

<140> 10/535,263

<141> 2005-05-17

<150> PCT/JP03/07407

<151> 2003-06-11

<160> 6

<170> PatentIn Ver. 3.3

<210> 1

<211> 23

<212> DNA

<213> Streptomyces avermitilis

<400> 1

gtgctgcaag gcgattaagt tgg

23

<210> 2

<211> 22

<212> DNA

<213> Streptomyces avermitilis

<400> 2

tccggctcgt atgttggtgtg ga

22

<210> 3

<211> 39912

<212> DNA

<213> Streptomyces avermitilis

<400> 3

gaattcttcg gcatcagccc ccgcgaagcc ctcgccatgg acccccagca acgactcctc 60
 ctcgaaaccg cctgggaaac catcgaacac gccggcatca acccccacac cctccacggc 120
 acccccaccg gagtcttcgc cggaatcaac gctcaagacc acgccgcgca tatccgcca 180
 agccgtgatg tggagaccat cgagggctac gccctgaccg gcagtccggg aagtgtggcg 240
 tccggccggg tggcctacac gctcgggctc gaaggccccg cgggtgcggg ggatacggcg 300
 tgttcgtcgt cgttgggtggc gttgcattgg gcggcgcagg cggtgcgtgc ggggtgagtgt 360
 tcgatggcgc ttgccggggg tgtgacgggtg atgtcgtctc cgggtacggt tgtggagttc 420
 tcacgtcagc ggggtctggc cgcggacggg cggtgcaagg cctattcggc ggctgctgac 480
 ggtaccggct gggccgaggg tgtggggatg ctgctggtgg agcggctctc cgacgcccg 540
 cgcaacggtc accgtgtcct ggccgtggtg cgtggcagtg cggtaacca ggacgggtgcg 600
 agcaacggtc tgaccgcgcc caacggggccc tcccagcagc gtgtcatccg tcaggccctg 660
 gccaatgcgg gactgacccc ggccgatgtc gacgcagtgg agggccacgg caccggggacc 720

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|------|
| actctggggg | acccgatcga | ggcccaggca | ctcctggccg | cctacggaca | acaccgcccc | 780 |
| caccaccgcc | ccttgtggct | gggatccctc | aaatccaaca | tcgggcacgc | acaggccgcc | 840 |
| gcgggcgctg | gcggagtcac | caagatggtg | atggccctgc | gcaacgggct | gctgccacag | 900 |
| acctccacg | tggacgagcc | cacccccag | gtcgactggt | ccacaggcgc | agtacaactc | 960 |
| ctgacacaac | cggtgccctg | gccccccgac | ccggccggcc | ggccacgcc | cgccggcgctg | 1020 |
| tcattcattcg | gcgtcagcgg | caccaacgcc | cacatcatcc | tcgaagaagc | acccactccc | 1080 |
| caggacagcg | ataccgacga | cgaaccgcct | gccaacgcac | cagccctgcc | ccatcccctc | 1140 |
| cctcttcccc | tgccggtgtc | ggcgaggctc | gaggccgggt | tgccggcgca | ggcacaggcg | 1200 |
| ttgcgccagt | acgtggcagc | ccgcccggac | atgtcacctg | ccgacattgg | tgccggctcg | 1260 |
| gcccgcggcc | gggcccgtact | ggaacaccgc | gacctcatcc | tgcccgcgga | ccgcgaggaa | 1320 |
| ctggcgagc | cactgacagc | cctggcagcc | ggcgaaacccc | acccccacat | caccacaggc | 1380 |
| cacacccggg | gcggtgaccg | cgggcgcgtc | gtcttcgtct | cccccgga | gggcccag | 1440 |
| tgggcgggga | tgggcctgac | cctgctcacc | tcctcaccgc | tggtcgccga | acacatcgac | 1500 |
| gcatgcgaga | aagccctcac | cccctgggtg | ccctggctcc | tgaccgacat | cctgcaccgc | 1560 |
| gaccccgacg | accccgcatg | gcaacaagcc | gacgtggctc | agcccgtgct | cttcagcatc | 1620 |
| atggtctccc | tcggccccc | gtggcgctcc | tacggcatcg | aacccgacgc | ggtcctcggc | 1680 |
| cactcccagg | gagaaatcgc | cgccgcccac | atctgcggcg | cactcagcct | gaaagacgcc | 1740 |
| gccaaaaccg | ttgactgcg | cagccgcgca | ctggccgcgc | tacgaggccg | gggcccag | 1800 |
| gcctcactgc | ccctgcccgc | ccaggacgtg | cagcagctca | tttccgaacg | gtgggaagg | 1860 |
| cagttgtggg | tggcagccct | caacggcccc | cactccacca | ccgtctccgg | cgacaccaag | 1920 |
| gcggtggatg | aggtgctggc | gcaactgcac | gacacgggcc | tacgggcca | acgcatcccc | 1980 |
| gtcgactacg | cctcccactg | ccccacgtc | caacccctcc | acgacgaact | cctgcactgc | 2040 |
| ctgggagaca | tcacccccca | cgcgctccac | gtgcccgtct | tctccaccgt | ggaaggcacc | 2100 |
| tggtgggaca | ccacaaccct | ggacgcccgc | tactggtagc | gcaacctcca | ccagcccgtc | 2160 |
| cgcttcagcc | acgccatcca | gaccctgacc | gacgacggac | accgcgcctt | catcgaaatc | 2220 |
| agccccacc | ccaccctcgt | ccccgccatc | gaagacacca | ccgaaaacac | caccgaaaac | 2280 |
| atcaccgcga | ccggcagcct | ccgcccgggc | gacaacgaca | cccaccgctt | cctcaccgcc | 2340 |
| ctgcccaca | cccacaccac | cggcatcggc | acaccacca | cctggcacca | ccactacacc | 2400 |
| caaaccacc | ccccaccaa | ccccacacc | cacctcgacc | tgcccaccta | ccccttccaa | 2460 |
| caccagcact | actggctcca | accacccacc | acaacaaccg | acctcaccac | caccggcctc | 2520 |
| acccccacc | accacccctt | cctcaccgcc | acactacccc | tcgccgacaa | caacacacaa | 2580 |
| ctactcaccg | gcgcctctc | cctacgcacc | caccctggc | tcaccgacca | caccgtcgcc | 2640 |
| ggcatggctc | tcctgcccgg | caccgcgctc | ctcgaactcg | ccctccaagc | cgccgaacgg | 2700 |
| gtggactgcc | ctcgggtgga | ggaactgacc | ctgcacgcac | cgttgggtgat | ccgcacacc | 2760 |
| gaggacgtga | cgttgccagg | caccgttcgg | gcagccgatg | agagtggcca | tcgcgcctc | 2820 |
| gcgatccact | cgtactccgg | caccgcgtcg | tcggcggacc | gggagtggac | ccgtcacgcc | 2880 |
| acgggcctcc | tcacacacca | cgccgacacc | gatcacctg | ccgacacgca | cacggacgcg | 2940 |
| tgccctggcg | ggagctggcc | cccgcgccgc | gcgcagccca | tcgaactggg | cgacgtctac | 3000 |
| ggtcgtatgg | cgccggactc | ggacatcgcc | tacgggcccgc | tcctccaggg | gctgcacgcc | 3060 |
| gcctggagg | tcggcgacga | tgtcctggcc | gaggtgcgtc | tgccggaaga | ggctctgcgc | 3120 |
| gatgctccgg | ggcgccctt | cgggtgtcac | ccggtcttgc | tcgacgcggc | cctgcacgcc | 3180 |
| acggcgctca | ccccccagaa | cggggacggc | tcgacggaga | acgtcgccca | ggagagcatg | 3240 |
| cctgaccgcg | cagcccacca | ggcgcgactg | ccgttcagct | ggagcggcgt | gtccctgcac | 3300 |
| acggcgggca | gttccgtggt | gcgcgtacgg | ctgtcgcgca | gtccgcagca | cggtaatgcc | 3360 |
| gtggccctca | ccgcggccga | cgaggacgg | cggccgggtg | tgacgatcga | gtcgctcgcg | 3420 |
| ctgcggccgg | tgtccaccga | ggagctgcgc | gcggccgcgg | atcgtaacgc | cgagcacgag | 3480 |
| tcgctcttcc | gactggactg | ggtttccgta | ccagtcccc | ccaacgcccc | ttcgccccacc | 3540 |
| gcggaccggc | cctgggagg | catcggcgcg | ggccttcccc | acctgcccgg | cctgacggag | 3600 |
| cacgagcaag | tgaccgcgta | tgacgagccg | gcggacctgc | ttctgggtct | ggaccgcgg | 3660 |
| gctccgcgcg | ccggtgtgct | ggtcgtaggt | ggtgtcgcgc | acaccgaagc | ccgggagtat | 3720 |
| tccgccgaag | cccccgggga | gcgcgggacc | gaggcctgcg | aggcccggcc | ggacgtcgtg | 3780 |
| cacgtggggc | tcgtgcacac | ggctgcccgtg | cacgcggctg | ccgcgcagat | ggtggccagg | 3840 |
| ctccaggcct | ggctgggcga | cgagcgccct | gcagacagcc | ggctgctcgt | cctgacgtgc | 3900 |
| ggcgcggtcg | cccgcgccct | cggcgacgat | gcgacggacc | tgcccggggc | cgccgtgtgg | 3960 |
| gggctgggtg | gttcgggcga | gtccgagcac | ccggaccgca | tcacgtgtgt | ggacttcgag | 4020 |
| cggggcacag | aggcgagacc | cggtcagctg | gcgacggcgc | tgaactgcgg | ggagcggcag | 4080 |
| cttgccgtcc | gccccggagg | gctgttcacg | ccacggctgg | tgccgcgcgc | acgtgtcgcc | 4140 |
| gacgccgtac | ccgcgctacc | cgccgtggcc | gtaccgtcag | cgggtcacgc | agccgtaccg | 4200 |

| | | | | | | |
|------------|-------------|------------|------------|-------------|-------------|------|
| gcagcgggtc | ccttccttcc | gggcggaacg | gtgctgatca | ccggcggaac | cgggtgtcctg | 4260 |
| ggccgggtcg | tggcccggca | tctggtggag | gcgacacggc | tacggcatct | gttgtctggcg | 4320 |
| ggtcggcgcg | gaccggacgc | cgaggttgcg | ccggagtgtc | gggcggagct | cgggtgggtc | 4380 |
| ggcgcgacgg | tggaggtcgt | cgcctgcgac | gcggcggaac | ggcagcagct | ggccgacctg | 4440 |
| ctgacacgga | tccccgacga | tggcccgctg | accggtgtcg | tgcacagtgc | gggcatcctg | 4500 |
| gacgacggcg | tgatcacgtc | gctgtcgccg | gagcggtcgc | gggcccgtct | ccgggccaag | 4560 |
| gcggacgctg | cgctgcttct | cgacgagctg | acgcgcgggg | cagagctgtc | ggctttctgtc | 4620 |
| atgtttctct | ccgcgtcggc | ggtggtcggc | tcgcccgggc | agggcaacta | cgccgccgcc | 4680 |
| aacgccgtcc | tcgacttctc | tgctcatcgc | cgccgcggcg | aggggctgcc | cgccgtctct | 4740 |
| ctgcctcggg | gcctgtggga | agagggcaca | gggatgacgg | gccacctcga | cgctgcagac | 4800 |
| catgcgcgga | tcagccgcgc | gggaatgcgg | ccgctgcgga | ctgccgaggc | tctggcgctg | 4860 |
| ttcgacgcgg | ccttggccga | cggcgagccg | ttcctgatgc | cggctcggct | cgacctcacg | 4920 |
| gccgtacggg | ctggtgcccgc | gtccgcaccg | gtgcgcggcg | tgctgcaagg | tctgcttcag | 4980 |
| ctgcctcggg | cccgtcggc | cgccgcggcc | cccgcccatg | gggcccggc | ggcggacgag | 5040 |
| gcggcgccct | ggcgtgagcg | tctggcccgg | cagagtgcgc | gtgagcgag | gcaggcgctg | 5100 |
| ctgcgcctgg | tgcggtcgca | tgctgcggcg | gtgctcggcc | atagcgggtg | cgacggaatc | 5160 |
| gacgcacgcg | gggcgttccg | cgagctgggg | ttcgactcgc | tcacggcggt | cgagctgcgc | 5220 |
| aaccgtctca | cggccgcgac | gggcctgcgg | ctgcgggcca | cgctggcctt | cgatttcccg | 5280 |
| accccggcag | cgctggccga | gcacttgggc | gagcgtctgc | ttcccgaaca | ggaggccacg | 5340 |
| ggcgagcaag | ccggcgatca | gctctccggc | ggcagcgagg | aggacgtacg | cagcctcctg | 5400 |
| acgtccattc | cgatcggcag | gctgcggggc | gcggggctcc | tcggggccct | gctcacgctc | 5460 |
| gcggacacgg | gcccgggcgc | ctcgggcggc | gccgcaggtc | cggaggacgc | gccgcctctc | 5520 |
| ggccagcgga | caccggctcc | cgtctcgatc | gacgagatgg | acatcgacga | cctgatggat | 5580 |
| ctggcgcacg | ggcatggcac | cgcacccgcc | cgtgagcccg | ccgacgcaga | ggactcgtcg | 5640 |
| tcacacgaa | accggacaca | ccacacacac | gaaggtgaga | cagcgtgaac | ccatccgagc | 5700 |
| cgctcggcct | gcccacgaa | cgtgtagtag | acaccgacc | gtccgatgcc | acgctctcac | 5760 |
| ccgaggccgg | cctgaacagg | tcaggagcgc | tgccccgtga | actgctgtcg | ttgccgggtg | 5820 |
| tggtgtgggc | cggggtcggc | ctgctgtttc | tggccctgca | ggcgtacgtg | ttcagccgct | 5880 |
| gggcggccga | cgggtgggtac | cggctgatcg | agacggcggg | ccagggtcag | ggcggcagca | 5940 |
| aggatacggg | gactaccgat | gtggtctatc | ccgtgatttc | cgctcgtctg | atcacgcccg | 6000 |
| cggcggcgtg | gctcttccgg | aggtgccgtg | tcgaacgacg | gctgctgttc | gacgcccttc | 6060 |
| tcttctcctg | gctgctgttc | gcgagctggc | agagcccgct | catgaactgg | ttccattccg | 6120 |
| ttctcgtctc | caacgcgagt | gtgtggggcg | cgggtgggtt | ctgggggtccg | tatgtgcccc | 6180 |
| gctggcaggg | ggcggggccc | ggtgcggagg | cggaaatgcc | gctggcgctg | gcctccgctc | 6240 |
| gcatgtcggc | tctgatcgtc | accgtgctgt | gcagcaaggc | actgggggtg | atcaaggccc | 6300 |
| gccggccggc | atggcggaac | tggcggtcgg | tcctggccgt | gttcttcatc | ggcatcgtgc | 6360 |
| tcggtctgtc | cgagccgctg | ccgtccgcct | ccgggatcag | cgatatgggc | agagcgctgc | 6420 |
| ccgaggtgac | cttgtggagt | ggcgagtggg | accagtccc | cgtgtatcag | gcggtcgggt | 6480 |
| ccggcctggg | ctgctgcatg | ctgggctcgc | tgcgcttctt | ccgcgacgaa | cgcgatgagt | 6540 |
| cgtgggtgga | acggggagcc | tggcggttgc | cgcaacgggc | agcgaaactg | gcgcgtttcc | 6600 |
| tcgcctggtg | cgggtggggtg | aatgccgtga | tgttcctcta | cacctgtttc | catatcctcc | 6660 |
| tgtccctcgt | cgggtggacag | ccgcccgaac | aactgccgga | ctccttccaa | gcgcggggcg | 6720 |
| cttactgagt | tcagggcagg | tcggaggaga | cggagaaggg | gaggcgaccg | gagttccggg | 6780 |
| cacctcccct | ttgtgcatgg | gtggacgggg | atcacgctcc | catggcgggc | ggctcctcca | 6840 |
| gacgcaccac | actcctcggg | tcagcgatca | tgccgagtcg | gttgggggag | acgtgagtg | 6900 |
| ccttcgtctt | gggcgggacc | tcgtcggccg | gaagggcggt | tagtcgccag | tgggaggcga | 6960 |
| cgaccgcgac | cgtaacggcc | gtctcgagaa | gggcgaagtt | gtcgccgatg | catttgtagg | 7020 |
| tgccgagcgc | gaagggcacc | cacgccccct | tgggaactcc | gcggctcgat | cccttggttt | 7080 |
| cccagcggcc | ggggtcgaga | cgttcggggt | cggggtacca | acgtgggtcg | cgctggatgg | 7140 |
| cgtacgcgct | gtacatgacc | tcacatcgg | cgggcaggtc | gtgaccggcg | agtcgtacgg | 7200 |
| gccgcaccgt | ccggcgggac | cccaccacgc | cggggtatct | gcgcagtgcc | tctttcacga | 7260 |
| ggttctgtgt | gtacggcagc | cgcgggagg | cctcgtgcgt | gggcaaccgc | ccgcccagga | 7320 |
| ccgtgtcgag | ctctgcgtgc | agccgactct | cgatctcggc | gttctgtccg | agctcgtgga | 7380 |
| aaatccacgc | cgtaatggca | gctggggcgc | cgatcccggc | caccgcgatt | cccatgacct | 7440 |
| cgtcatggac | ctcctggtcc | gtcatggagg | caccttcggc | gtccgtcgcg | cgcagcatcg | 7500 |
| tcgagagcag | gtcaccgtgg | tcgcggccat | cggcgcgata | cgccgtgatc | gcctcccggg | 7560 |
| tcgttcgctg | cgtaacggcc | acggaccgct | tgcccggcgt | gggaagaacc | tcgtaaagg | 7620 |
| tggggcgag | agcaactcag | cgggccacct | tcagaatgtc | gtgtccgggt | ttccgcagcg | 7680 |

| | | | | | | |
|-------------|------------|-------------|------------|-------------|-------------|-------|
| ccgcctcggc | cttcgcgccc | aggtcggaga | agaacacgct | cttcgtgatc | atggcaagcg | 7740 |
| acaggctcgca | ggcggcctgc | tcaacgtcca | ccacctgccc | agcgctccag | gaatcagcgg | 7800 |
| tctcctgccc | ggcggcggcc | atggtggcga | catagctctc | gaggcgctgg | cggtggaacc | 7860 |
| ctggctgcat | ccgcctccgc | tgtcgcgggt | gcgtctcccc | cgatacggct | acgaggatgg | 7920 |
| ggccgatgaa | gcggctcgcg | ccctgtgcgc | ccttgctccg | ggtgaaatcg | cccgatccgg | 7980 |
| aggagaccag | catggtccgc | accaggctccg | ggtgcgtggc | gaggtaggcg | gttttcggcc | 8040 |
| cgaggcggag | cttgagcagg | tctccgtgat | ctgctgcgga | gcgaaggaa | tccaggggct | 8100 |
| gccgcaccaa | cggcggcaca | tggccgacga | ccggccaggc | gccgggcgcc | tccgggaatgc | 8160 |
| tgctcgtcga | ctgggacatc | acgagtgtc | ctttgcgggg | tgaagggggg | tggctgggag | 8220 |
| gggaaccaca | gtgacgagt | aagggggagg | tgtgggggtt | ggcgctcgcc | cgggggtgag | 8280 |
| cgtggacatg | ggagtgggag | ggagtgaagt | gagctcggag | tggtttctgg | gcttcattga | 8340 |
| gattcgaatc | cgacttccct | gtcgatgaga | gcgaacatct | cctcgtccga | tgtctctgcg | 8400 |
| aggctcgggg | cgggtgtcgt | gccgttcaac | ttctgggcga | gggaatgcag | tcgggaggcc | 8460 |
| agccgcgtgc | gcgcgccgtc | gtccagcggg | gcagcggagg | atgtggtgga | ggagagcact | 8520 |
| accgcctcca | gccgctcgag | ctccgagagc | agcgagggca | gccccggggg | tgtcgttgcg | 8580 |
| gcgtccggct | cgcccgcgcc | ggtgagtccc | ttgctgacga | gttgtgtgtg | gaggtggtag | 8640 |
| gtgaggggtg | tgggggtggg | gtggtcgaag | gcgaggggtg | tggggaggcg | gagtcgggtg | 8700 |
| gtgtgggaga | gccgggttgc | tagttcgacg | gcggtgaggg | agtcgaagcc | gaggtcgcg | 8760 |
| aacgcgcgg | cgggggggat | ggtgtcgggg | gtggtgtggc | ccaggacggt | ggcgatgtgg | 8820 |
| gagcggacca | gggcgaggag | ggtggtgtgc | tgtgtgtcgt | gtgtctggcc | ggccagccgg | 8880 |
| ccgtgcagct | gggcgcggtt | gtccgcacca | ccggtagtgg | tgggtgcgggt | ggtgcggcgg | 8940 |
| cgggtggcgg | gcaggagggt | ctgcagcagg | ggcggcaggg | gcggggcgcc | acgcaggtcg | 9000 |
| gcgggcagca | ggaccggccg | gtccagagcc | agggccgcat | cgaagagggc | cagtgcgtcc | 9060 |
| gggtgcgaca | tgggatgcag | accggaacgg | atgatgcgcc | ggtggtcgg | gccggccaga | 9120 |
| tgcccggtca | tcccgttggc | ctcttccac | agccccacg | ccagcgacac | ccccggcaga | 9180 |
| cccgcgcccc | gccgcgggta | cgccagcgcg | tccagagcgg | cattggccgc | ggcgtagtgt | 9240 |
| ccctgccccg | ccgaccccag | gatccccgcg | gccgaggaga | acagcacgaa | cgccgacagc | 9300 |
| tccatacccc | gcgtcagctc | atccagcaaa | agagcggcat | ccaccttggc | cgcgaacacc | 9360 |
| gtgcccagcc | cgtcggcgct | gagagaggcg | atcgtcgcac | cgtccagcac | accatcgcca | 9420 |
| tgacagacac | ccgtcagcgg | acaccgggca | ggaacaccct | ccagcagccg | gaccacctcc | 9480 |
| cgcgcgtccc | ccacatcaca | cgcaacaatc | cgcacctccg | cccccaacgc | ggccagctcc | 9540 |
| gcccgcacaa | cctccgcacc | cggagcatcc | ggaccacgcc | ggctcaccaa | caacagatcc | 9600 |
| cgcaccccc | acacaccagc | cagatgccgc | gccaccgccc | caccacagca | accggtcccc | 9660 |
| cccgtcacca | acacgacccc | acccgacaac | cacggcaaca | cctcccgacc | cgatacatca | 9720 |
| accgctgact | caagtctgtg | caggcgtgcg | gccagacccc | gctcacccag | caccgccaac | 9780 |
| tgcggtcac | cacacgccac | caccgcagcc | acacgcccac | catccagacc | agaccccata | 9840 |
| ccggcctcgt | tgcggcatc | gcggtcagcg | ccgctgtcga | ggtcgggtgt | caggtcgagg | 9900 |
| aggacaaacc | ggtccggatg | ctcagcctgc | gccgaccgca | ccagccccca | caccgcccga | 9960 |
| cccaccacat | ccaccggggc | atccaccggg | ccgtcctccg | ggccggccac | caccgcaccc | 10020 |
| cgggtcacca | ccaccagccg | cgaacccgca | aaccgtcca | gccccagcca | cccctgcacc | 10080 |
| acacccaaca | ccccaccaac | aacctcacc | acaccaccgc | caccaccgcc | gccatcgcca | 10140 |
| ccggcatccg | ggcaccgcaa | caccaccacc | cccggcacac | catcctcctc | agccgccaga | 10200 |
| ccaacgaggt | cgtcggcacc | atccagcacc | accaccgatg | ccccgcccga | caccagtaca | 10260 |
| tctgagggca | cctcaaccca | cttcatgtcg | aagagctcag | cgcgctgtac | ggcgcgctcg | 10320 |
| gcagctcgca | attcgtccgc | cgccaacggg | cgcaccgcca | acgcctcgac | ggacgccacg | 10380 |
| ggcgtaccgg | tgtcatccgt | gaccagcacg | gaaactgcgg | cgtggccgct | gttcggatcg | 10440 |
| gccggcgaga | gtcgcacgcg | caacgacgac | gcattggcgg | cgtgcagcgt | cacaccggtg | 10500 |
| aaggagaacg | gtacggatcc | ctgcggcaga | ctgcccgacg | gcgcaaaggc | cgctgcgtgc | 10560 |
| aaggcagcat | ccagcagtgc | cgggtgcagg | ttgtacgcgg | atgcctcgcc | gtgcacctgt | 10620 |
| tctggaaggc | gaacctcggc | aaacacctcg | tctcccagac | gccaggcagc | agtcagcccc | 10680 |
| cggaatgcgg | ggccatagac | aaagccattt | gcctcgtagt | cgccatacaa | ggctgccaat | 10740 |
| tcctcatcag | cacagcgaac | tgcgcccgtc | ggcggccaca | tcgacagatc | atcgtggcta | 10800 |
| cggcctgtct | caatgcgcga | ggtcttgggt | cccgaacgg | ccgtggcggtg | atgacggcag | 10860 |
| ggagccgctg | cgggggcggt | ctcgcttcgc | gagtagatcg | tcagtgaacg | agtgtcggtg | 10920 |
| tcgtccggtg | gattgatgtg | cacctgaacg | tcgacggcac | cctcacgggg | gatgacgaga | 10980 |
| ggcgtgtgga | gggcgagttc | ttcgaggtgg | tcggtcgtgg | ttgcttggag | ggcgagttcg | 11040 |
| aggaggcg | ttcctggcac | aagagtggta | ccgacgacgg | tgtggtcggt | gagccagggg | 11100 |
| tgggtgcgta | gggagaggcg | gccgggtgag | agttgtgtgt | tgttgttggc | gaggggtgag | 11160 |

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|-------|
| gttgcggtga | ggaggggggtg | gtgggtgggg | gtgaggccgg | tgggtggtag | gtcggttgtc | 11220 |
| gtgggtgggtg | gttgagagcca | gtagtgtctg | tgttggaagg | ggtagggtggg | caggtcgagg | 11280 |
| tgggtggttgt | gggggtgggg | gtgggttttg | gtgtagtggt | ggtgccagggt | ggtgggtgtc | 11340 |
| cgaatgccgg | tgggtgtgggt | gtgggcgagg | gcggtgagga | agcgggtgggt | gtcgttgtcg | 11400 |
| ccgcggcgga | ggctgccgggt | cgcggtgatg | ttttcggtgg | tgttttcgggt | ggtgtcttcg | 11460 |
| atggcgggga | cgagggtggg | gtggggactg | atttcgatga | agggcggtg | tccgtcgtcg | 11520 |
| gtcaggggtct | ggatggcgtg | gctgaagcgg | acgggctgggt | ggaggttgcg | gtaccagtag | 11580 |
| gcggcggtcca | gggttgtgggt | gtaccagacc | aggtgcccta | cgacgggtgga | gaagaacggc | 11640 |
| atggtggacg | gctgggggggt | gatgtctccc | agcaggtgca | ggagttcgtc | gtggaggggt | 11700 |
| tggacgtggg | ggcagtggga | ggcgtagtgc | acggggatgc | gtttggccc | tagggcgggt | 11760 |
| tcggcacagt | gggtgaggag | ttcttctact | gcggtgggtg | cgccggagac | ggtggtggag | 11820 |
| tgggggcccgt | tgagggtctg | caccacaac | tgcccttccc | accgttcgga | aatgagctgc | 11880 |
| tgcacgtcct | gggcgggcag | gggcagttag | accatggcgc | cccggcctcg | tacggcggcc | 11940 |
| agtgcctggc | tgcgcagtgc | aacggttttg | gcggcgctct | tagggttag | tgcgccgag | 12000 |
| atgtggggcg | cggcgatttc | tccctgggag | tggccgagga | ccgcgtcggg | ttcgatgccg | 12060 |
| taggagcgcc | acagggcggc | gagggagacc | atgatgctga | agagcacggg | ctggaccacg | 12120 |
| tcggcttggt | gcatgcccgg | gtcgtcgggg | tcgcggtgca | ggatgtcgggt | cagggaccag | 12180 |
| ggcaccaggg | gggtgagggc | tttctcgcac | gcgtcgatgt | gttcggcgaa | cacgggtgag | 12240 |
| gaggtgagca | gggtcaggcc | catcccggcc | cactggccgc | cctgtccggg | gaagacgaag | 12300 |
| acgacgccgc | cgcggtcact | gccccgggtg | tggcctgtgg | tgatgtgggg | gtggggttcg | 12360 |
| ccggtgcca | gggctgtcag | tgcctgcgcc | agttcctcgc | ggtccgcggc | caggatgacg | 12420 |
| gcgcggtgtt | ccagtacggc | ccggccggcg | gccagacccg | caccgatgtc | ggcaggtgac | 12480 |
| atgtccgggc | gggctgccac | gtactggcgc | aacgcctgtg | cctgcgcccg | caaccgggcc | 12540 |
| tcagacctcg | ccgacaccgg | caccggcacc | ggcaccggct | cagactcagc | caccggaagg | 12600 |
| gctggattcg | gagcaccac | cgacaccca | ccaccggcag | caccgcccgc | cgccgcaggc | 12660 |
| gcctcctcca | aaatcacatg | ggcgttggtg | ccgctgacgc | cgaatgatga | cacgccggcg | 12720 |
| tggcgtggcc | ggccggccgg | gtcggcgggc | cagggcaccg | gttgtgtcag | gagttgtact | 12780 |
| gcgcctgtgg | accagtgcac | ctgggggggtg | ggctcgtcca | cgtggagggt | ctgtggcagc | 12840 |
| agcccggttc | gcagggccat | caccatcttg | atgactccgc | ccacgcccg | ggcgccgtgt | 12900 |
| gcgtgcccga | tgttggaatt | gagggatccc | agccacaagg | ggcggtgggtg | ggggcggtgt | 12960 |
| tgtccgtagg | cggccaggag | tgcctggggc | tcgatcgggt | ccccagagt | ggtcccgggtg | 13020 |
| ccgtggccct | ccactgcgtc | gacatcggcc | gggtcagtc | ccgcattggc | cagggcctga | 13080 |
| cggatgacac | gctgctggga | gggcccgttg | ggcgcggtca | gaccgttgct | cgcaccgtcc | 13140 |
| tggttgaccg | cactgccacg | caccacggc | aggacacgggt | gaccgttgcg | acgggcgtcg | 13200 |
| gagagccgct | ccaccagcag | catccccaca | ccctcgggcc | agccgggtacc | gtcacgacgc | 13260 |
| gccgaatagg | ccttgaccgc | cccgctccgc | gccagacccc | gctgacgtga | gaactccaca | 13320 |
| aacgtacccg | gagacgacat | caccgtcaca | ccccgggcaa | gcgccatcga | acactcacc | 13380 |
| gcacgcaacg | cctgcgccgc | ccaatgcaac | gccaccaacg | acgacgaaca | cgccgtatcg | 13440 |
| acggtcacgg | ccggaccctc | aaggccaaag | ctgtaggcca | cccggccgggt | cgcgacgctg | 13500 |
| cctgcgctgc | cgttggcgat | gaggccttcg | aaaccctcgg | ggacatgggtg | gagacgcgcg | 13560 |
| gcgtagtctg | ggtacatcac | cccggcgaag | acaccgttac | gggagccacg | catcgacagc | 13620 |
| ggatcgatac | ccgcccgctc | gaacgcctcc | cacgacgtct | ccagcaacaa | ccgctgctgc | 13680 |
| ggatccatcg | ccaacgcctc | acgcggactg | atcccgaaga | agtccgcac | gaactcccc | 13740 |
| gcctcataca | aaaaccgcgc | ataccgcgcg | tacgacgtcc | ccgaccgggtc | aggggtccgaa | 13800 |
| tcaaacaacc | cctccagatc | ccacccccga | ccggccggaa | attcaccaat | cgcaccccc | 13860 |
| cccagcgcaa | ccagctccca | caactcctcc | ggcgaaacaca | ccccacccgg | aaaacgacac | 13920 |
| gccatcccca | caatcgcaat | cggctcatcc | gcggcaacct | gatgaagtgc | gacctgcgat | 13980 |
| ggcgtctcgc | cttcgcgcgtc | gtcgcccatc | agctcacgac | gtaggtgacg | cgccagggtc | 14040 |
| gctgcattcg | gctggtcgaa | gaccagactg | gtcggcagtc | gcagtcccg | tgcctcacc | 14100 |
| aggcggttac | ggagttccac | cgctgtcaag | gagtcgaagc | ctaggtcgcg | gaacgccgag | 14160 |
| tcaacgggga | tcatctccgg | cgcgttgttg | ccgaggacgg | tggcgatgtg | ggagcggacc | 14220 |
| agggcgagga | gggtgggtgtg | ctggtgttcg | tgtgtctggc | cggccagccg | ggcatgcagc | 14280 |
| tggcgcccg | tgtccgcacc | accggtagtg | gtggtcgggg | tgggtcgggc | gcgggtggcg | 14340 |
| ggcaggaggt | cctgcagcag | gggcggcagg | ggcgggcgcg | gacgcagggtc | ggcgggcgagc | 14400 |
| aggaccggcc | ggtccagagc | cagggccgca | tcgaagagag | ccagtgcgtc | cgggggtcgac | 14460 |
| atgggatgca | gaccggaacg | gatgatgcgc | cgggtggtcgg | tgccggccag | gtgcccggtc | 14520 |
| atcccgctgg | cctcttccca | cagccccac | gccagcgaca | cccccgccag | acccgcgcgc | 14580 |
| cggcgccgggt | acgccagcgc | gtccagagcg | gcattggccg | cggcgtagtt | gccctgccc | 14640 |

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|-------|
| gccgacccca | ggatccccgc | ggccgaggag | aacagcacga | acgccgacag | ctccataccc | 14700 |
| cgctcagct | catccagcaa | aagagcggca | tccaccttgg | ccgcgaacac | cgtgcccagc | 14760 |
| cgctcgggcg | tgagagaggc | gatcgtcgca | tcgtccagca | caccagccgc | atgcacgaca | 14820 |
| cccgtcagcg | gacacccggc | aggaacaccc | tccagcagcc | ggaccacctc | ccgcgcgtcc | 14880 |
| cccacatcac | acgcaacaat | ccgcacctcc | gcccccaacg | cgccagctc | cgcccga aaa | 14940 |
| ccctccgcac | ccggagcatc | cggaccacgc | cggtcacca | acaacagatc | ccgcacccca | 15000 |
| cacacaccag | ccagatgccg | cgccaccgcc | gcaccacgca | caccgcgtcc | acccgtcacc | 15060 |
| aacaccgacc | cacccgacaa | ccacggcaac | acctcccgac | ccgatacatc | aaccggcgac | 15120 |
| tcaagtctgt | tcaggcgtgc | ggccagcacc | cgctcaccac | gcaccgcaa | ctgcggtca | 15180 |
| ccacacgcca | ccaccgcagc | cacacgcca | ccatccagac | cagaccccat | accggcctcg | 15240 |
| ttgccggcat | ggcgctcagc | gccgctgtcg | aggctcgggt | ccaggctcag | gaggacaaac | 15300 |
| cggtccggat | gctcagcctg | cgccgaccgc | accagcccc | acaccgccgc | acccaccaca | 15360 |
| tccaccgggc | cgtcctccgg | gccggccacc | accgcacccc | gggtcaccac | caccagccgc | 15420 |
| gaacccgcaa | accgctccag | ccccagccac | ccctgcacca | cacccaacac | cccaccaaca | 15480 |
| acctcaccca | caccaccgcc | accgccgcca | tcggcaccgg | catccgggca | ccgcaacacc | 15540 |
| accacccccg | gcacaggccc | accaccgctc | tcacccacgt | cctcgtgcc | cgcccacgcc | 15600 |
| tgccccacaca | ccggcacagg | acccacctca | gccactgca | ccgcatacag | cgaaccccg | 15660 |
| cgccccgcgc | aaaccgagac | agcacgcaac | tgacccatat | ccacaggccg | caactcaaga | 15720 |
| cgatcgaccg | acgccaccgg | caccccggtg | tcgtcgggtga | tgcgcacgca | cacggccgcc | 15780 |
| cctgtcgctc | caagcgctcg | caggcacgcg | cgacaggaga | ctgcaccatg | cgtacggaac | 15840 |
| cgcagaccgt | tccacacatg | gggcacgacg | ggcgtccccg | gacccgccac | agaaagcagg | 15900 |
| ccggtgccct | gaagggcagc | gtcagcagcg | gccgggtgca | gaccgtacgc | cgccgcgtct | 15960 |
| cccgacactt | cttcgggaag | acgtgcctcg | acgaggatgt | cgtcgccgta | gcgcagggc | 16020 |
| gcgcgcaacc | cttggaaatgc | caggccataa | gcaaagccgg | cgtcgcccat | ttgatcgtaa | 16080 |
| gccgtgttca | ggtcgacagg | cgtagctcca | acgggaggcc | aggggtccgc | aagcagctcg | 16140 |
| tacgaggcag | tgtcatcgtc | cttggcaggg | ctcagcacac | ccgcggcatg | acgcgtccac | 16200 |
| gcaactggccg | acgcacggtc | tccaccactg | ccgccctcac | cgcgtagagt | gatggctatc | 16260 |
| atgcggcgac | ccgactcgct | cggcgccgca | atggcaacct | gaagggtcac | gtctccgacc | 16320 |
| tcaggaatga | ccaacgggtg | gttgagcgtc | agctcgcca | cgtggctcga | acccacactt | 16380 |
| tctccggcat | gaagggccag | ttccgcgaag | gccgtaccgg | gcagcagcac | gacaccgcct | 16440 |
| accgcatggc | cggcgagcca | gggatgcgtg | cgcaacgaga | ggcgccccgt | cagtaggcag | 16500 |
| ccgtccccct | cggccagttc | caatgtggcg | ccgagtaggg | ggtgttcggt | ggggtcgagt | 16560 |
| ccggctgctg | acacgttgcc | ggcaccgggc | tgtgtgcttt | cgagccagta | gtggtggtgt | 16620 |
| tggaaagggg | aggtggggag | gtcagaggtg | gtgtgggtgt | gggggttggt | gtggtggtgg | 16680 |
| gtgtagtggt | gggggtgcca | ggtggtggtg | gttttgccga | gggttggtgag | gaggtgggtt | 16740 |
| tgggggtggt | ggtgggggtg | ggtgaggggtg | aggggtggtg | tgggggtggt | gggggtggtg | 16800 |
| tgggtgggtga | gggtggtgag | ggtgtgtcgc | ggtccgagtt | cgatgtaggt | ggtgacgccg | 16860 |
| tgttgggtgga | gggtttgggt | ggtggtggct | atgtcgacgg | tgttgcgggc | ttgttgggtc | 16920 |
| cagtagtggtg | gggtgaggag | ttggtcgggt | ggggtgttgg | cggtgatgag | gggggtgtgg | 16980 |
| ggtgggtggt | aggtgagggg | ttgggtgtgc | tgggtgagtt | ggttgaggat | gggggtggtg | 17040 |
| tggggggagt | ggaaggcgtg | gttgggtggg | aggggttttg | ttttgatgcc | ttgttcttgg | 17100 |
| cagaggggtg | tgatgtgttg | gacgggtgtg | ggggtgccgc | tgatgacgag | ggaggtgggg | 17160 |
| gtgttgatgg | cggcgatggc | gaggtcgttt | tcgtgggcgg | tgatgtggtg | ggtgatgtgg | 17220 |
| tgggggggtg | tgtggagggg | ggtcatggtg | ccggggggca | tggtttgcat | gaggggtggc | 17280 |
| cgttgggtga | tgaggggtggt | ggcgtcgggt | aggggtgagga | tgccggcgag | gtgggcggcg | 17340 |
| gtgatttcgc | cgagggagtg | tccggcgtag | tagtgggggg | tgatgtggtg | gccgtcgggt | 17400 |
| aggaggcggt | ggagggcgac | ctggaaggcg | aagagggcgg | gctgggcgta | cggggtctgc | 17460 |
| tggagcagtg | cggccgcttc | ttcgaggggtg | gtggtgtcct | gggtgttggg | gtcctgggtg | 17520 |
| aggaggggga | ggaggggggtg | gtcagaggtg | gggtcgaggt | gggtgcagat | gtcgttgagt | 17580 |
| gcggcgggcga | agacgggggtg | ggtgtggtag | aggccgtggg | ccatgccggg | gcgttgggtg | 17640 |
| ccctgtcccg | agcagatgaa | tgcggtcttt | cctgcggcct | ccccggctcc | ggtcccgctc | 17700 |
| ggggcgctgc | tgtggatgac | ggcgggggtg | ggttcgcctg | cggcgagtgc | ctggagtgtc | 17760 |
| tgcaaggaag | tgtcgcggtc | ggcggcgatg | aggttgccgc | gggtggtcga | cacggcgcg | 17820 |
| gcgtgggcga | gggtgtatcc | gacgtcggcg | aggtcgaggc | cgggggtggtc | ggtgaggtgg | 17880 |
| gcgtgcaggg | cctgggcctg | ggcgcgcagg | gccggctcgc | acttggccga | caccagccac | 17940 |
| ggccacaccc | ctggactgcc | ggcagcagcc | tcctcgccac | taccggcatc | ctcgccggcg | 18000 |
| ggtggtcccc | ccggaacgtc | gtcggcgggt | gtgtctgacg | ggatgttgtg | ggcgggtgct | 18060 |
| tcttcgagga | tgacgtgggc | ggtggtgccg | ctgacgccga | atgatgacac | tcctgccccg | 18120 |

| | | | | | | |
|-------------|-------------|------------|-------------|------------|-------------|-------|
| cgtagccgcc | cctccccgcc | gggccagggc | accgtctccg | tcagcagctg | caccgcaccc | 18180 |
| gcggaccagt | ccacatgcgg | cgacgggtca | tccacatgca | acgtcccgcg | cagcagacca | 18240 |
| ttccgcagcg | ccatcaccat | cttgatcacc | ccggcgacgc | ccgcggcagc | ctgtgtgtga | 18300 |
| ccgacattgg | acttgaccga | gcccagccac | agcggccctt | cgccggcacg | gtcctgcccg | 18360 |
| taggtcgcaa | ggagggcctg | ggcctcgatc | gggtcgccca | aagtgggtgc | gggtgccgtgg | 18420 |
| gcctccaccg | catcgacatc | accggccgac | aagccggcgt | tggcgagggc | ctggcggtatg | 18480 |
| acacgctgct | gggagggccc | gttggggcgc | gtcagcccgt | tgtcgcgacc | gtcctgggtg | 18540 |
| accgcaactg | cacgcaccac | ggccaggaca | cggtgaccgt | tgcgacgggc | gtcggagagc | 18600 |
| cgctccacca | gcagcatccc | cacacctca | ccccagccgg | tcccgctcgc | cgccgccgag | 18660 |
| aacgccttgc | aatgcccgtc | cgcggccaga | ccccgtgccc | gcgaaaactc | cacgaaggca | 18720 |
| cccggagagc | acatcacctg | cacacccccg | ccgaagcgcca | tcgagcactc | acccgcacgc | 18780 |
| aacgcctgac | aggccagatg | taaagccacc | aacgacgagg | aacaagccgt | gtccaccgac | 18840 |
| accgcaggac | cctcaaaaacc | aaacgtgtac | gagatacgac | cggaggccac | actcccggat | 18900 |
| gtgccgggtca | ggacatagcc | ctcgggtgtc | gtcgcggcgt | tttcgtgcag | cctgggtcca | 18960 |
| taggcctgcg | gaatgaggcc | cgcgaacacg | cctgtctggc | tcccgctgac | ggctgtaggg | 19020 |
| tcaataacctg | cctgcctccat | ggcctcccat | gaggcctcca | gcagcaatcg | ctgctgcggg | 19080 |
| tccatcgcca | gtgcctcacg | cggactgatc | ccgaagaagc | cggcgctgaa | ctcccccgcg | 19140 |
| tcgtagagga | aactcccaca | gcgggtgtac | gaggtgcccg | gccgaccggg | ttccggatcg | 19200 |
| aacagtgtct | ccaggtccca | cccacgggtc | gtcggaaact | cgccgaccgt | gtccctcccc | 19260 |
| gatgcgagca | gttcccacag | ctcctcggct | gaggtgacgc | ctccgggata | gcggcacgcc | 19320 |
| atgccaatga | tcgcgacggg | ctcgtcctgg | tctgcaggca | cagccgcagc | acggggagct | 19380 |
| gggatggagg | cagtgtgtgt | cgagcccaga | agttgtgtgt | ggaggtggtg | ggtgaggggtg | 19440 |
| gtgggggttgg | ggtggtcgaa | ggcgagggtg | gtggggaggc | ggagtccggg | ggtgcgggag | 19500 |
| agccggttgc | gtagtctgac | ggcgggtgag | gagtcgaagc | cgaggtcgcg | gaacgcgcgg | 19560 |
| tcggggggga | tgggtgtcgg | ggtggtgtgg | ccgaggacgg | tggcgatgtg | ggagcggacc | 19620 |
| agggcgagga | gggtggtgtg | ctgttgttct | tgtgtctggc | cggccagccg | ggcatgcagc | 19680 |
| tgggcgccgt | tgtccgcacc | accggtagtg | gtggtgcggg | tgggtgcggc | gcgggtggcg | 19740 |
| ggcaggaggt | ctcgcagcag | gggcggcagg | ggcggggcgg | gacgcaggtc | ggcgggcagc | 19800 |
| aggaccggcc | ggtccagagc | cagggccgca | tcgaagagag | ccagtgcgtc | cggggtcgac | 19860 |
| atgggatgca | gaccggaacg | gatgatgcgc | cgggtggtcgg | tgcgggccag | gtgcccggtc | 19920 |
| atcccgctgg | cctcttccca | cagcccccac | gccagcgaca | cccccggcag | acccgcgcgc | 19980 |
| cgccgcgggt | acgccagcgc | gtccagagcg | gcattggccg | cggcgtagtt | gccctgcccg | 20040 |
| gccgacccca | ggatccccgc | ggccgaggag | aacagcacga | acgccgacag | ctccataccc | 20100 |
| cgcgtcagct | catccagcaa | aagagcggca | ttcaccttgg | ccgcgaacac | cgtgcccage | 20160 |
| cgtcgggttgg | tgagagaggg | gatcgtcgca | tccgtccagca | caccagccgc | atgcacgaca | 20220 |
| cccgtcagcg | gacacccggc | aggaacaccc | tccagcagcc | ggaccacctc | ccgccgctcc | 20280 |
| cccacatcac | acgcaacaat | ccgcacctcc | gccccaaacg | cggccagctc | cgcccgcaaa | 20340 |
| cctccgcac | ccggagcatc | cggaccacgc | cggctcacca | acagcagatc | ccgcacccca | 20400 |
| cacacaccag | ccagatgccg | cgccaccgcc | gcacccagca | cacccgctcc | acccgtcacc | 20460 |
| aacaccgacc | cacccgacaa | ccacggcaac | acctcccagc | cagcaacatc | accggaccgc | 20520 |
| tgagcaggta | catcaacgga | cgactcaagt | cgcgtcaggc | gtgcggccag | cacccgctca | 20580 |
| ccacgcaccg | ccaactgcgg | ctcaccacac | gccaccacgg | ccgccacatg | cccaccatcc | 20640 |
| acgccccaac | cagcaccagc | accagcacca | gcaccgggtg | cgaggtcggg | gccggtgtcg | 20700 |
| gtgtcgggtg | cgaggtcgag | gaggacaaac | cggtcgggat | gtcagacctg | cgccgaccgc | 20760 |
| accagcccc | acaccgccc | acccaccaca | tccaccgggc | cgtcttcttg | gccggccacc | 20820 |
| accgcacccc | gggtcaccac | caccagccgc | gaacccgcaa | accgctccag | ccccagccac | 20880 |
| cctgcacca | cacccaacac | cccaccaaca | acctcaccca | caccaccgcc | accgcgcgca | 20940 |
| ccggcacccg | catccgggca | ccgcaaacac | accacccccg | gcacaggccc | accaccgctc | 21000 |
| tcacccacgt | cctcgtgcca | cgcccaacgc | tgcccaacac | ccggcacagg | accacacctc | 21060 |
| gcccactgca | ccgcatacag | cgaaccccg | cgccccgccc | aaaccgagac | agcacgcaac | 21120 |
| tgacccatat | ccacaggccg | caactcaaga | cgatcgaccg | acgccaccgg | cacacccgcc | 21180 |
| tcacccccc | ccacgcctca | caccgcctca | cgcgcggcgc | cccgccttac | agccacaca | 21240 |
| cgcacccgca | caccggctac | acccgcccgg | tgaaagcgaca | caccacccca | cacagccggc | 21300 |
| acccgaacac | cctccccgaa | ccccgcccc | tccccaaacc | ccgtcccacc | cggaagcaac | 21360 |
| accgacaacg | gctggaccac | accatccagc | aacgcccgat | gcagcccaaa | accagccgca | 21420 |
| tcaccccaacg | cctcctccgg | cagacacacc | tcagccagca | aatccccccc | atcacgccac | 21480 |
| accgcacgca | gccccgaaaa | caccggcccc | aaaacacaac | cagccccagc | caaacgggtca | 21540 |
| cggacaccat | cgacatccac | cgccaccgca | ccccgcggcg | gccacacccc | cgccagacca | 21600 |

| | | | | | | |
|-------------|-------------|-------------|------------|-------------|-------------|-------|
| tccaccacca | caccaccacc | agcagcagcc | tcaaccagca | cccccgaggg | atgacacgtc | 21660 |
| cacacccccac | ccgacgcacc | acccccacca | caagcactcc | caccccgcg | atacacactc | 21720 |
| accaaacgcc | gcccctcccc | atccgcagcc | gcaaccccaa | cctgcacact | cacacccccca | 21780 |
| cccacaggaa | ccaccagcgg | cgcattgcaca | gtgagttgct | cgattcgggt | gcagcccacg | 21840 |
| cgttcgccaa | cctggaccgc | cagctccacg | aacgccgacc | ccgacagcag | gaccgcaccc | 21900 |
| cccacctcgt | aatcgccag | ccacggatgc | gagcgcaagg | acaggcgacc | cgtcagtagg | 21960 |
| cagccgtccg | tgtctgcgag | ttggactgtt | gccgcgagca | gaggggtgtc | ggccgggtcc | 22020 |
| aagccagcag | cggcgacgtc | acctgctccc | gtgggagcgt | cgagccagta | gtgctggcgt | 22080 |
| tggaaagggat | aagtggggag | gtcagaggtg | tggttgtggg | gggtgggtgtg | gtgggtgggtg | 22140 |
| tagtggtggt | gccaggtggt | gggtgtgccg | atgccgggtg | tgtgggtgtg | ggcgaggggcg | 22200 |
| gtgaggaagc | ggcgggtgtc | gttgctgcgg | cggcgaggcg | tgccgatcgc | ggtagcgtct | 22260 |
| tcggcggtgt | cttcgggtggt | gtcttcgatg | gcggggacga | gggtgggggtg | ggggctgact | 22320 |
| tcgacgaaga | cgcggtgtcc | gtcatccgcc | agggcctgga | cgccatcgct | gaaacggaca | 22380 |
| ggctggtgca | ggttgcggtg | ccagtaggcg | gcgtccaggg | ttgtggtgtc | cagccaggtg | 22440 |
| ccctccaccg | tggagaagaa | cggcacgcgg | gacggctgcg | ggctgatgtc | ccccagcagc | 22500 |
| tcacgaact | cctcccgcag | gggtgtcaca | tgggggcagt | gcgaggcata | gtcgaccggg | 22560 |
| atccgcgggg | cccgaccccc | ggtgccggca | cagtaccgca | gcacctcgtc | caccgcctcg | 22620 |
| gcatcccccg | agacggcggt | ggagcggggg | ccgttgaccg | ccgccaccca | caaccgcccc | 22680 |
| gcccaccgct | caccaatgag | ctgctccacc | tcctgggcag | gcagcggcac | tgaggccatg | 22740 |
| ccgccccggc | cccgcacagc | ggccagcgcc | cggctgcgca | gcgcaacagt | cttcgcgcgc | 22800 |
| tccttcaggc | tcagcgcccc | acacacatgc | gcggccgcga | tctcgccctg | ggaatggcca | 22860 |
| aggaccgcgt | cgggttcgat | accgtaggaa | cgccacagag | cagccaaaga | caccatgacg | 22920 |
| ctgaacagca | caggctggac | cacatcgcc | cgtcccaca | ccgcatcccc | cgcgtcccg | 22980 |
| cgcaggatgt | ccaccacaga | ccagtccacc | cacggcgcca | gagcctcctc | gcacgcctgc | 23040 |
| atccgcgggg | cgaacaccgg | agaggaggcg | agcagacgca | cacccatccc | ggccactgc | 23100 |
| ccaccctgtc | cgggaaacac | gaagacgaca | ccgccccggg | caccacccgg | cgcattgacc | 23160 |
| gtggtcacc | gccgatccgg | ctcaccgcgc | gccagcgccc | ccaacccttg | caccagctcc | 23220 |
| tcacgggtccg | cggccaggac | gaccgcacga | tgctccagca | cagcccgccc | acaggccaga | 23280 |
| cccgaaccca | catcgcaag | cgaaacgtcc | ggcggagctg | ccacgtactg | acgcaacg | 23340 |
| tcgcctgcg | cccgcaaccc | agcctcagac | ctagccgaca | ccggcacagg | aaccggcacc | 23400 |
| ggcaccggca | ccggcaccga | ctcagccacc | ggcgacagca | cagccactgg | agcggccacc | 23460 |
| gactcagcca | ccgaaatggc | aagacccgga | gcacctcca | acaccccacc | cccggcaaca | 23520 |
| cagccccccg | ccgcggcg | ctcctccaaa | atcacatgcg | cattcgtgcc | actgaccccc | 23580 |
| aacgacgaca | ctcccgcgg | ccgcaaccgc | cctgccgcgt | ccccgggcca | cggcaccg | 23640 |
| tcggtcagca | gccgcaccgc | ccccgcggag | cagtcacact | gcggcgacgg | ctcatccaca | 23700 |
| tgcaacgtcc | gcggaacac | cccctccgc | aacgccatca | ccatcttgat | gacccccacc | 23760 |
| acacccgcgg | cagcctgcgc | atggccgatg | ttcgacttca | ccgatcccag | ccacagcg | 23820 |
| ctgttacgg | cccgtgccc | gtacgtggcg | agcaacgcct | gcgcctcgat | cggatcacc | 23880 |
| agcgtcgtgc | ccgtcccatg | cccctccacc | acatccacat | ccgccacgga | caaccccg | 23940 |
| ttcgccaacg | cctgccggat | caccgcctcc | tgagccggac | cattcggcgc | cgtcaaccca | 24000 |
| ttcgacgcac | cgtcctgatt | gaccgcactg | ccgcgcagca | ccgccagcac | ccgatgccc | 24060 |
| agccgcaccg | catccgacaa | ccgctccacc | aacagcatcc | cgcgcctc | gcccattg | 24120 |
| gtgccgtcgg | ctccaccgc | gaaggacttg | cagcgccgct | ccaccgacag | tcgcgcgtg | 24180 |
| cgtgagaact | cgacgaagag | gtgcgggggtc | gacatcaccg | tcacaccgcc | ggccagcg | 24240 |
| agcgtgcact | caccgcaccg | cagcgactgg | cacgccagat | gcagcgccac | caacgacgac | 24300 |
| gaacatgccg | tgtccaccga | gacggcaggg | ccctcgagac | cgagcgtgta | ggcgacgcgg | 24360 |
| cccgaacgca | cggcgccgc | gctaccgttg | ccgatgtagc | cctcgaatcc | ctcggggatg | 24420 |
| gtaccacggc | gggatccgta | gtcgtggtac | atcaccccg | cgaagacacc | cgtacgggag | 24480 |
| ccacgcacgc | acagcggatc | gatacccgcc | cgctcgaacg | cctccacga | cgtctccagc | 24540 |
| aacaaccgct | gctgcggatc | catcgccaac | gcctcacgcg | gactgatccc | gaagaagtcc | 24600 |
| gcatcgaaact | ccccgcctc | atacaaaaac | ccgccatacc | gcgcgtacga | cgtccccgac | 24660 |
| cggtcagggg | ccgaatcaaa | caacccctcc | agatcccacc | cccgaccggc | cggaaattca | 24720 |
| ccaatcgcat | ccccaccga | cgcaaccagg | tcccacaact | cctccggcga | acacaccca | 24780 |
| cccggaacac | gacacgccat | ccccacaatc | gcaatcggtc | cgtggagcgc | ctccatggcg | 24840 |
| gctgccagtt | gctcattacg | tgcccgagg | gtctggttcg | ccttcagaga | cgccctaagc | 24900 |
| gcgtcgacga | gcttttcgct | ggacgtgtcc | atcactgtct | cccaaattca | agaagtctca | 24960 |
| gaaaggcccg | tatggcgcta | agggggaaag | cactgatcga | tgccggagcc | gaccggatac | 25020 |
| caccgactgg | ccgactggcc | gaccggccga | ccgggctgtg | cccgaccgc | cgatcagggg | 25080 |

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|-------|
| cgcgatcagg | accgcatca | gaggcgcgat | cagcgccgca | ctgatgcgat | ttctgtcagc | 25140 |
| cattcgtcga | catgccgagc | agtcgaatcc | gcaaactgtt | ccagcatcgt | gaagtgattc | 25200 |
| ccctggatgt | ccagaacggt | gtgcggaact | ccccacggcg | gcggcatctg | ttctccgtcc | 25260 |
| cggccgcgca | ggaagagggc | gggtgtgggt | atgtccggag | gactccagcc | ggagaagatg | 25320 |
| cggaaagtatc | cgcccatggc | gaccaggcgt | gtgtagtcca | cgccacaaa | ctgcgtgacg | 25380 |
| cggtcgaaga | tttcaattgt | cagcgcgga | gcgacaggtg | cgatgccgtc | gtccgggaga | 25440 |
| taggcgtcca | tggtcaccac | cgcttccgga | cggacgccta | gacgctccag | atgactcgtc | 25500 |
| accgcgtaga | cgaaccatcc | gcccgcggaa | tgcccggcga | gcgcaaaagg | cgcgccgtcg | 25560 |
| gtgaaccgga | cgatcgcgtc | ggcgaaatg | cgggtcaccg | cgccgattcc | ggacggcagg | 25620 |
| ggttgcacct | ccaggaaccc | tggcgaggga | acgtaccaga | cgtctcgggt | tccgttcagt | 25680 |
| cccgcgcgca | aacgtgagta | ctggtacacg | ctcgacacgg | cggcgacggt | gggcaggcag | 25740 |
| atgagggcgg | gccgtgtttc | gccccgggcg | agtgcctcac | cttgggcgcg | cgcttcaccc | 25800 |
| tgggcgagcc | ggacgaacgt | cggctccggg | atgtccgagg | ggctccgtgaa | ggcgggcccg | 25860 |
| aagaaggagg | ccgccgagag | cagggccatg | gactcctcga | tgcggcgggt | gtcgtgtccg | 25920 |
| atccagaaca | gggattcgac | ggtttcgggt | gaggtgccgc | ccctgggtctg | ctgcttctcg | 25980 |
| ctccccgtac | tgcgctgctg | tccggctctg | gcactccctg | cgtccccggc | cccggctgcc | 26040 |
| gcggcggcag | gggcccggctc | gtccggcggt | cccgcctcgg | ccgtcaggcg | ggctgcgagg | 26100 |
| tgatcggcga | gtgccgcggg | gctgggctgg | tcgaagatga | gcgttgccgg | gagggcgagg | 26160 |
| ccggtgacgg | cgttgatccg | gctgcggagt | tcgacggcgg | tcagcgagtc | gaagccgagg | 26220 |
| tcgcggaact | cgggtgtcggc | cgggaccaga | tcgtccggga | gtgcgcgctc | cgcggtgtg | 26280 |
| acggcgctgg | tgggggtggcc | gaggacggcg | gcggcatggg | tccgtacgag | ttccaggagg | 26340 |
| agaccgggtg | gctgcgcggg | gatggtgagt | cgggccaggc | gctgcgcgag | cgtggcgggg | 26400 |
| gtgtcggtcg | cgatgccgtg | gtcggcggac | cgccgggccc | ggatgcggat | cagcccgtgc | 26460 |
| aggatgcgcg | gcagggcgcg | ggcgtgggcc | tgtgcgtgga | gggtggccgc | gtcgagccgg | 26520 |
| gtggcgagga | gcagcccgtc | accgaaagg | ccgaggcgat | ccgtgtgtgc | gaggagcgcg | 26580 |
| agtccctgtg | cgttgagacg | ggggagcagg | ccgcgcgggg | ccatgcgcgc | gaagtccgtg | 26640 |
| ccggcgaggt | tgcgggtcat | gccgtcggcc | tcgccccaaa | ggccccaggc | gagcgaccgg | 26700 |
| cccggcagtg | cctgggtgtg | gcgggtgctg | atcaggggcgt | ccagaaaggc | gttcgcccg | 26760 |
| gtgtagttag | cctgtccggg | actgccgaag | agggcgccgg | ccgaggagaa | gacgttgagg | 26820 |
| gtggtgagga | cggcgctcgc | ggtcaggctg | tcgaggtgcg | cggcgccgaa | cgccttcgcg | 26880 |
| tgcaggacgg | cctccatgcg | ctccggagtg | agcgaggtga | ggatgccgtc | gtcgaccaca | 26940 |
| ccggccgtgt | ggatcacggc | tttcaggggg | tgctgcgcgg | gcacttggtc | gaggagcgcg | 27000 |
| gcgacggccg | cccgggtccc | gatgtcgcag | gccgcgaccg | tggcctcggc | gccgaggccg | 27060 |
| gcgagttcgg | cgaccaggtc | ggcgggcggc | tcgcgcggcg | tgccgcggcg | gggtggccagc | 27120 |
| agcaggtgcc | gtaccccgtg | ggcgtggcg | agatgacggg | cgacgagccg | gccgaggacg | 27180 |
| ccggtaccgc | ccgtgatgag | gaccgtggcc | tcgggtccc | agtcggcgct | gggtggtgctc | 27240 |
| ggctgtggct | gccggacggg | cactcgtgtc | atccgcggga | tcgggacggc | accatttcgc | 27300 |
| agggcgatct | gcggttcccc | ggccagcagg | ggaaggcggt | tcggggaggc | gtcgggtgtcg | 27360 |
| tcggtgtcgg | ccagcaggaa | ccggtcgggg | ttctcgggtc | gcacggagcg | gaccagtccc | 27420 |
| cagacggcgg | cgtgtgcgag | gtcggacacg | ggctcgtcgg | gggtcgcggg | gaccgagccg | 27480 |
| tgcgtgagga | gggcccaggc | gcaggccgcg | agccgttcgt | cggcgacca | ttccttgagg | 27540 |
| agggcgagga | cgcgggtggg | ggcttgccgg | gtggcgtcgg | cgagggcggg | ggagtccggc | 27600 |
| ggggccgagc | cggccggggc | ggaatcgggt | agggcggaat | cggtaggggc | ggaatcgggt | 27660 |
| ggggcggatg | cgcggtccgg | ctcgacagag | atgacgacca | tgcccgggtg | cggggcgccg | 27720 |
| gccgccaggg | cttctgcgag | agccgcgggg | tcgggtagg | cctgccaggga | ggcgccgttg | 27780 |
| cgtccaggga | cggcggccgt | ccgcggggca | ccggggccga | ttaggggcca | gtcgggtgtc | 27840 |
| cgtgccgggt | tgggtggggag | gtgcagcggc | cgccattcga | tgcggaagag | gtggctcgtg | 27900 |
| tagccgggtg | gcgcggcctg | gagctgctcg | cgggagacgg | gccggaaggc | gagggacccc | 27960 |
| gcggagatga | cgatgcgtcc | cgatgcgtcg | gtggccagca | gtccgaccgc | gtcctcgtcc | 28020 |
| gtgcggacgg | tgagacggac | gtgcagggtg | gaggcgccgg | aggcggcgac | cgtgacgcgg | 28080 |
| gtccaggaga | acggcagcca | gccgtgtccg | tcggcgccgg | catcgccctc | gtggcgcgaga | 28140 |
| acgaccgggt | gcagtgcgcg | gtccagcagg | gccgggtgca | gggcgtaccg | ggcgccgtcg | 28200 |
| gccgcctgtc | cctccgtgct | ctcgggcagg | gtgacgacgg | cgaacacctc | gtccccgcg | 28260 |
| cggcagacct | cgcgcagccc | ctggaaacac | ggcccgatc | ccaggccggc | gccggccagc | 28320 |
| tgctcgtaac | agccgtccag | gtccaccggg | gctgcgtcgg | cgggcggcca | cggttcctgt | 28380 |
| gtgtgctcct | ccgcggggccg | ggcgggtgccg | gtcaggacgc | cgggtggcgtg | gcagggtccac | 28440 |
| tcggtgccgg | tcgcccgcgc | ggacgaggac | gacagtccgt | cgtcttcgcg | ggcgtaacagg | 28500 |
| gcgaagggtg | gccgttcggg | ctcctcgggc | gtctgggggc | cctgggggtg | cccgaaggag | 28560 |

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|-------|
| agttgcagga | tcaccgagcc | ctgttcggga | aggacgagcg | gtgtccgcag | ggtgagttcc | 28620 |
| tcgacgggtgc | cgcagtcgac | ctcgtcgcct | gcgcgcacgg | ccagttccag | gatggccctg | 28680 |
| ccgggcagca | ggacgggtacc | gaagatggcg | tggtcggcca | gccacgggtg | tgtgcgcagg | 28740 |
| gagagacggc | cgggtgaagag | gagttcctgc | gactcggcca | gtgccaccgc | ggaaccgagc | 28800 |
| aggggatgcc | cggcggtgcc | gagccccgct | gccgacaggt | cccccggtg | gccggccgag | 28860 |
| gtgtcgaccc | agtagcgggtg | gtgatcgaag | gcgtaggctc | gcaggtcgag | gtggcgggct | 28920 |
| cgatcgcggt | cgggcagggc | ggcggggccag | ttgaccgccg | ccgctccgtg | cgtatgcagc | 28980 |
| cgggccaaagc | cgggtgagcag | ggtgccgggt | tccgggctgt | ccggccgtag | gagcgggatg | 29040 |
| agcaggttct | cttgccggggt | gccgggtgtcg | tcgtcggcgg | ggtggctgtc | ggcgggtggcc | 29100 |
| ctagggcatt | cctcgccag | tgccgacagg | gtcccgtctg | ggcccagttc | catgaaggtg | 29160 |
| cggactccgt | cgggtgtgcag | gcggctgacg | gcgtcgccga | agcgcacggt | ccgcgtacc | 29220 |
| tgccggaccc | agtactcggg | gtcgtcagtc | tctcccgcg | ccacgatgtc | gccgggtgagc | 29280 |
| gtcgacacca | tgggaatggc | tggttcgctg | taggtcagcg | aggccgcgac | ctgctggaac | 29340 |
| tcctccagca | tcgggtccat | cagcgggtgag | tggaaaggcat | gcccggttcg | caggcgcttg | 29400 |
| actctccgcc | cgcgctcggc | gaaccagttc | gccatgttcc | ccacctcgtc | ctcggcgccg | 29460 |
| gagaacacca | ccgagggcggg | tccgttcacg | gccgcgaccg | acaccgggc | ttcccggccg | 29520 |
| tcgagcgccct | gtcgcgcctc | ggcttcgctc | gcccgtagcg | cgaccatggc | gccgcctggt | 29580 |
| gcgagctgct | ccatcaggcg | cccgcggggc | gccaccaggc | ggcaggctgc | tgccagggga | 29640 |
| agcaccgccg | cgcgctgggc | ggccgcgagc | tcgccgatcg | agtggccggc | cacgaagtcc | 29700 |
| gcgcgcacgc | cgcgacgttc | caggtgccgg | aagagcgcgga | cctggacggc | gaacagcgcc | 29760 |
| ggctgggctg | accgcgtacg | gtccagaaca | tccgcggcat | ccgcgacatc | cgcaagatcc | 29820 |
| gcactggcgt | ggatcagcgg | gcgcagggcg | tggtccagg | gaccgtccag | ttccgccagt | 29880 |
| acctgggtcca | gcgcgtccgc | gtaggccggg | tgagccgcat | acagctgacg | gccattccc | 29940 |
| acgcgttgcg | tgccctgtcc | ggcgaacagc | atggcggtct | ttccgcgccg | gcggcctgag | 30000 |
| tgcccgccac | gcggggccgac | cgacccttcg | atcaggccgt | ccgccgaccg | gccctcggcc | 30060 |
| agcgcgtcga | gggcctgaag | gaagccgtcg | cggtccctcg | ccacgacgac | ggcccgggtga | 30120 |
| tcgaacacgg | accgctgtgc | cgccagggcg | tgcgccacgt | cgccggggccg | ggcatcggat | 30180 |
| gccctggcag | cgaactgccg | caaccgtcgc | gcctggcccc | gcagcgctcg | ctcggacttg | 30240 |
| gcggagagca | accgaaggat | gggcaggagg | gccggcttgt | cggacatggc | gtcggcgagc | 30300 |
| cactccggtt | cagccgactt | gtcggacacg | gcctcggcga | cgcactcagc | cgacatctcg | 30360 |
| gacatggcgt | cggcgacgca | ctccggttca | gccgacatct | cggtcacggc | gtcagcgacg | 30420 |
| cactccggtt | cagccgcctc | ctcttgccgg | tcggtgaggt | ccgccgggtc | ggtggcgtcg | 30480 |
| accacgtggg | gcgcctcgac | cggcgccctgc | tcgacgatga | cgtgcgcctc | agccgggtacc | 30540 |
| ggctcactga | tgacgtgcgc | ctcgaccggc | gcctgtcga | tgatgacgtg | ggcgttggtc | 30600 |
| ccgtctgact | cgaacgcgga | gacgcccgcg | gccttggggc | ggccgttctg | ctgcgcagtc | 30660 |
| acgggctcgg | tgagaagccg | gacgcccgcg | ctcgaccagt | cgatgtgggg | ggagggttcg | 30720 |
| tcgatgtgca | ggctgggtcgg | caacagttcg | tggttcaggg | ccatgaccat | cttgatcaca | 30780 |
| ccggccacac | ccgcggcagc | ctgcgcacgc | ccgatgttcg | acttcaccga | ccccaaaccac | 30840 |
| accggccgct | ccccgaacg | accctgcccg | tacgtggcga | gcaacgcctg | cgccctcgatc | 30900 |
| ggatcaccca | acgtcgtacc | cgtcccgtgc | ccctccacca | catccacatc | cgccacggag | 30960 |
| aaccccgcac | accgaacgc | ctgccgaatc | accgcgtgct | gcgacggacc | attcggcgcc | 31020 |
| gtcaacccat | tcgacgcacc | gtcctgattc | accgcaactc | cccgaccac | cgccaaaacc | 31080 |
| cgatgaccac | gacgttcagc | ctcggacagc | cgtccacca | acagcacacc | cacaccctcg | 31140 |
| gccagccga | ccccatcggc | ccccgacccg | tacgccttgc | accggccgtc | cggcgacaga | 31200 |
| ccccgctgcc | gcgagaactc | cacaaacgca | cccggcgctg | acatcacctg | cacaccccc | 31260 |
| gccaacgcca | gcgaacactc | ccccgacctc | aacgcctgac | acgccagatg | cagcgccacc | 31320 |
| aacgacgacg | aacacgcgt | atccaccgtc | accgcgggac | cctcgaagcc | gaagggtgtg | 31380 |
| gaaagccgcc | cggagacgac | gctgttgagg | acgcgggtga | gcgcgtaccc | ctcgtggtcc | 31440 |
| tgggtgccgc | ggcgcaggag | ctcggcgtag | tcctgctgcg | agacgccggc | gaagacaccg | 31500 |
| gtcgtggacc | cgtgcagcgt | ggcggggctg | atgcccgcgc | gctccaacgc | ctcccaggac | 31560 |
| acctccagca | tcaaccgctg | ctgcggatcc | atcgccaacg | cctcacgcgg | actgatcccc | 31620 |
| aaaaaccgca | catcgaactc | cgccgcaccc | tgaaaaaacc | caccacaccg | cgtgtaggac | 31680 |
| gtacccgccc | ccccggctc | cggatcatag | aaagcctcca | cgtcccaacc | ccggtcgacc | 31740 |
| ggaaactccc | ccaccgcac | ccgacccgac | gcgatcaact | cccagaaatc | ctccgccgac | 31800 |
| tccacacccc | ccggaaaacg | gcacgccatc | cccacaatgg | caatcggctc | gtcgacatcc | 31860 |
| acacgcgggtg | ccggggcccg | aagggcaagg | gcaagggcag | tgccgggtgt | cgggcttcg | 31920 |
| ccgctcagct | gctcgtggat | gtgtgccgcg | agtgccaccg | ggcggggatg | gtcgaacacc | 31980 |
| agggtcctcg | ggaagcgcag | gcccgtggcg | gtgttgaggc | ggttgcgtag | ttcgacggcg | 32040 |

| | | | | | | |
|------------|-------------|-------------|-------------|-------------|-------------|-------|
| gtgagggagt | cgaaaccgag | gtcgcggaag | gcgcgctcgg | gcaccaccgc | atcggcggtg | 32100 |
| ccgtgtccaa | ggacggccgc | ggcatgggta | aggaccaggt | ccagcacggt | ctcggcctgt | 32160 |
| gcggcggggt | cgagtcgggc | gaggcagtcg | cgcagcatgc | cgcgcgcac | ggtgtccacc | 32220 |
| gcctccgaca | actgaccacc | ccactgcca | gagaccccgg | aaccccgcgg | cgccccctcc | 32280 |
| acatccagcc | aaaagcgctc | tcgctcgaac | gcatacgtcg | gcagctccac | cccgcaacca | 32340 |
| ccagcgaccc | cgcgaccaac | actcccgaac | acaccggacc | actcaaccgc | cacccccacc | 32400 |
| acgaacaact | cggccacgga | catcaggaag | cgtcgcaagc | cgccttcgcc | ccggcgcaga | 32460 |
| gatccgacga | ccaggctgtc | caagtcaccc | atctcgtcca | gggtttcctg | cacaccgacc | 32520 |
| gcgacggccg | gatgcgggca | cgcctcgatg | aagacgggtg | ggccggcgcg | gaccagcgcc | 32580 |
| tgtgtcgcgt | cccggaaagc | gacgacctgg | cgcaggttgc | ggtaccagta | gtcggcgctg | 32640 |
| agttcgggtg | cgtcgatgcg | ttcgccggtg | acgggtggag | agaagggcac | gtcggcggtc | 32700 |
| ctcgcgcgga | tgggggagag | gagttcgagc | agccgcccc | ggatcgctc | gacctgcggg | 32760 |
| gagtgcgacg | cccagtcgac | catgagcctg | cgggcccgtg | cgtcttcgtg | tgacagctcc | 32820 |
| tccaccaggg | cgtcgaccgc | ttccggctcc | ccggagacca | cggccgaacg | cgccccgttc | 32880 |
| acggcgggca | tgaccagacg | gtcgccecat | gtcgcaagac | gcggtccag | cttctcgacc | 32940 |
| ggcagaccga | ccgatgccat | cgccectgc | ccggccagtg | cggccagcgc | ctggctgcgc | 33000 |
| agggcggtga | cccgggcggc | gtcgtcgagg | gagagtgcac | cggcgacgta | ggcgctgcgc | 33060 |
| atctcgccct | gcgagtgcc | ggccaccgcg | tcgggtgta | caccgtacga | gcgccagagc | 33120 |
| gccgccagcg | agaccatcac | cgcgaagagg | acgggctgga | cgacatcgac | gcgttgaga | 33180 |
| gggggtgcgt | ccggtgcgcc | gcgcaggacg | tcgaggagag | accagtccag | gtacggttcg | 33240 |
| agggcttggg | cgcagtcgga | catctgctgg | gcgaagaccg | gtgaggagcc | gaggagtcc | 33300 |
| tgcgccatgc | cttcceagtg | ggtgccctgt | cctccgaaca | gcatggcgat | ctttccgtcg | 33360 |
| gccgcccgtg | cggccacacc | ctgtaccacc | cccgcggtgg | gtgccccctc | ggccagtgcg | 33420 |
| tcgagtgcgt | gcaggaactc | gtcgcgggtc | tcggccacga | ccaccgcacg | atgctcgaac | 33480 |
| accgaccgct | ccgacaccaa | agcccgcctg | acccagccg | gactcaccac | cacaccatcc | 33540 |
| gcacccccac | caaccgccac | aaccccacgc | aaccgacgcg | cctgcccccg | caacgccaac | 33600 |
| tccgaccgcg | ccgacaccac | ccacggcacc | acccccgaac | ccgacaccac | ccccggaccc | 33660 |
| aactcctgca | gcccggccgc | acccccatcc | gcgcccccg | acgcctcctc | caaaatcaca | 33720 |
| tgcgcattcg | tccactcac | ccgaacgca | gacaccccc | cacgcgcgag | ccgaccctcc | 33780 |
| acccccggcc | actccacctc | atccgccaac | acacgaaccg | acccactcga | ccaatccacc | 33840 |
| tgcgacgacg | gtcatccac | atgcaacgtc | cgcggcaaca | ccccgcctcg | caacgccatc | 33900 |
| accatcttga | tcacaccgcg | cacaccgcga | gcagcctgcg | catgcccgat | gttcgacttc | 33960 |
| accgacccca | accacaccgg | ccgtcccccc | gaacgaccct | gcccataagt | ggcgagcaac | 34020 |
| gcctgcgcct | cgatcggatc | acccaacgtc | gtaccctgct | cgtgccccct | caccacatcc | 34080 |
| acatccgcca | cggacaaccc | cgcacacgcc | aacgcctgcc | gaatcacccg | ctgctgcgac | 34140 |
| ggaccattcg | gcgcctcaa | cccattcgac | gcaccgtcct | gattcacccg | actccccgcg | 34200 |
| accaccgcca | aaacccgatg | accacgacgt | tcagcctcgg | acagccgctc | caccaacagc | 34260 |
| acacccacac | cctcggccca | gccgacccca | tcggcccccg | acccgtacgc | cttgccaccg | 34320 |
| ccgtccggcg | acagaccccc | ctgcccgcgag | aactccacaa | acgcaccccg | cgtcgacatc | 34380 |
| accgtcacac | ccccgcacaa | cgcacgcgaa | cactcccccg | acctcaacgc | ctgacacgcg | 34440 |
| agatgcagcg | ccaccaacga | cgaacgaac | gccgtatcca | ccgtcacccg | cggaccctcg | 34500 |
| agccccaggg | tgtaggcgac | gcgtccggat | gtgacgctgc | tggacaggcc | cgtcatggcg | 34560 |
| tagccctcga | ggtcctcggt | ggcccggcgc | acgaggtcgg | cgtagtcctg | actgcacatg | 34620 |
| ccggcgaaga | caccggctcg | ggaccgcgcg | aacgtggcgg | ggtcgatgcc | cgcccgtctc | 34680 |
| aacgcctccc | aggacacctc | cagcatcaac | cgtgctgcg | gatccatcgc | caacgcctca | 34740 |
| cgcggactga | tcccgaacaa | ccccgcacgc | aactccgccc | cacctccag | gaaacgcgcc | 34800 |
| cggcgcgatg | acgacgaacc | cgcgcgcgcc | ggctccggat | catagaaagc | ctccacgtcc | 34860 |
| caaccccggt | cgaaccgaaa | ctctcccacc | gcaccccgac | ccgacgcgac | cagttccacc | 34920 |
| aagtcctccg | ccgactccac | accccccgga | aaacggcacg | ccatccccac | aatcgcaatc | 34980 |
| ggctcgtcaa | cgtcgacacg | cgaacgcggg | accggaggag | caatgtcacg | ctggccgcgc | 35040 |
| gcgcctcct | ccagctgttc | cttgaggtat | ccggccagcg | cggaggaggt | ggggtagtgc | 35100 |
| aagatcagcg | tggtagggcg | gaggagcccg | gtgacggcgt | tgaggcggtt | gcgcagttcg | 35160 |
| acggcgctca | cggagacgaa | gcccaggctg | cggaaaggctc | gctcaggggc | tacggcggtg | 35220 |
| gggggtgctg | gtccgagcac | ggtcgcgcgc | tacgtacgga | ccaggctcgag | aagcgcacgt | 35280 |
| tctgctcgg | cgggtgtccat | ggccttgagc | cgtcgggaga | acgagtcggg | ggatgcgggtg | 35340 |
| gcggtgtcga | gtccgggtggt | ttcccggggc | aggcgtgctt | cggggatgtc | gctgatgagg | 35400 |
| ggcgagagtc | gggagccggg | gagggagttg | gcggtgaatc | ggtcccagtc | gatgtcggcg | 35460 |
| accgtcacac | aggtctcgtc | atggtccaac | gcctggccca | gtgccaccag | cgcgctctcc | 35520 |

| | | | | | | |
|-------------|-------------|-------------|------------|------------|-------------|-------|
| ggcgtcatcg | ccgccagacc | ccgacgcgcg | atctgcccc | cgccccctc | cgccatcccc | 35580 |
| ccaccagccc | acggaccccc | cgccaccgcc | aacccccgga | ggccctcacc | acgcgcgtgc | 35640 |
| cgaacgattg | cctccacata | cgcgttcgcc | gccgcgtaac | ccccctgtcc | cgccggcccc | 35700 |
| aacgtcgccg | cagccgacga | gaacaccacg | aacccccgaa | gacccgcccc | ccgcgtcaac | 35760 |
| tcatgcagat | tccaggccgc | cagcgccttc | gcccgacga | cccccgtag | acgctcggac | 35820 |
| gacaacccct | ccaacacccc | gtcatccaca | actcccgccg | catgcaccac | cacaccagc | 35880 |
| gggcaactccg | ccggaacggc | cgaccgcaac | acctccgcca | acgcctcacg | gtccgcgcga | 35940 |
| tcacacgcca | ccaccgacac | ccgcgcgccc | aagcccatca | agtcgcgtcg | gagttcttcg | 36000 |
| actccctggg | cgctctcccc | gcgtcggctc | accagcagca | gggtgtcggc | gccacgcccg | 36060 |
| gccatccacc | gggcgacgtg | cgcacccaac | tcgcgcgtgc | ctccggtag | gagtagcgtg | 36120 |
| ccgcggggcc | gccactcccc | ctccgcgacg | gcctcctcca | acggcgcccc | caccaaccgc | 36180 |
| cgcacaaacg | ccccgaaga | ccgcacggca | aactcactct | cacccccctc | ccccacacc | 36240 |
| gccagcacac | ctaccaaccc | atcgaccacc | cgctcatcca | cgagctccgg | cacatcaacc | 36300 |
| agcccacccc | agcgggtccg | tgcctccgcc | ccaccacac | ggcccagccc | ccacaccaca | 36360 |
| cccagggccg | gccccacac | agcatcccg | ccccccaccg | acacggcccc | gcccgtcaca | 36420 |
| caccacagcc | gcgccccac | gcccacatca | cccagcgct | gcaccaaccc | cacagacgcc | 36480 |
| actcccgcc | gcacgacgcc | actccccag | ccacaagg | agacgacacc | gccgacagcc | 36540 |
| tcaccatcga | ccgcctcacg | cagggtggccg | gccaacactt | ccctgtctac | acaccccgct | 36600 |
| tccacctcca | ccgaaccac | tcgcgcccc | caccgctcca | acccctccgc | caccacatca | 36660 |
| accggggccc | cctcgccctc | ggacaccacc | agccacgcgc | ccgacagccc | ccctacacca | 36720 |
| ccgcccga | cggttcgcca | cacctccga | tagcgccacc | cgtcaccac | ttcacgctcg | 36780 |
| tgccgtaccc | gccccattc | ccccaacgcc | gacaccaccg | caccagcga | cgccccctca | 36840 |
| tcacccccaa | ggagcgatgc | caccaccccc | gcatcaccac | actcgaccgc | ctccccaaac | 36900 |
| ggaccacccc | acatcccgga | aaccccgga | cctcccgag | atccctctc | cacgtccagc | 36960 |
| caaaatcgct | cccgctcaaa | cgcatacgtc | ggcagctcca | ccccgcattc | atcaccgacc | 37020 |
| tcgcgagcag | tcctctcgaa | cacaccggcc | cactcaaccg | ccgtcccagc | cacgaacaac | 37080 |
| tccgccagg | cggtcatgac | cgaccgtgcc | tccggctgg | ccggcccgag | ggcggggatg | 37140 |
| gcgcggggcc | gtgcaactgag | cgagtctgt | gcgagggccg | acagcgtgcc | gtcggggccg | 37200 |
| atttcgaggg | aggtggtgac | gccctgttc | tgaagccatg | agatgccgtc | gcgaaacgg | 37260 |
| accgtgctgc | gggcgtgttc | gacccagtag | tccgggggtg | acatggtctc | ggcggggag | 37320 |
| ggcgcgccgg | tgacgttgga | gacgacggga | atccgcgggg | cgctgaaggt | gacctgctcg | 37380 |
| gccgcgcggc | ggaagtgcgc | caacatggcg | tccatgtgcg | gcgagtgga | ggcgtggctg | 37440 |
| gtccgcagcc | gcggggtgcg | gcggcctcgt | gccgcccatt | gctgcgcgag | gtccaggacc | 37500 |
| gcgtcctcgt | ccccggagag | gacgatcgac | cgcgcccgct | tcaccgcggc | gtgcgcgacc | 37560 |
| cgggatgcgt | attcgtcggg | cagcgggagg | atctcgctct | cggacgcctc | gatggccacc | 37620 |
| atggctccgc | cggacgggag | cccttgcatc | aggcgccctc | gtgcgaccac | cagtgccacc | 37680 |
| gcgtcggcaa | ggcagagcat | cccggcgaca | tgggcggccg | ccagttcacc | gacggaatgg | 37740 |
| ccgaggacgt | agtcgggcgt | cagaccccag | gtctccagca | gccggaacag | cgccacctcg | 37800 |
| aaggcgaaca | gggcgggctg | ggcgaaaccc | gtgtcctcga | tcagccggcc | ttcgggagag | 37860 |
| tcctgcgggtg | cgaagagtac | gtcccgagc | ccaggggcac | cggggtcggt | gcgggcgggtg | 37920 |
| tcggcctccg | cgcagatctc | gtcgatggcc | tgggcgaaga | cggggtacgc | ctcgtacagt | 37980 |
| tcgcggccca | tgcttgccgc | ctgggttccc | tgcccggcga | agagtacggc | gagttcgccc | 38040 |
| gaggtggttc | gtccctcgac | gacgcggggc | acggggcgcc | cgccggccag | tgctcgagt | 38100 |
| gcgtgcagga | actcgtcgcg | gtcctcggcc | acgaccaccg | cacgatgctc | gaacaccgac | 38160 |
| cgctccgaca | ccaaagcccc | cccgaaccca | gccggactca | ccccacacc | atccgcaccc | 38220 |
| ccaccaaccg | ccacaacccc | acgcaaccga | cgcgcctgcc | cccgcaacgc | caactccgac | 38280 |
| cgcgcgcgaca | ccaccacggc | caccaccccc | gaacccgaca | ccacccccgg | acccaactcc | 38340 |
| tgcaaccggc | ccgcaccccc | acccgcgccc | cccgacgctc | cctccaaaat | cacatgcgca | 38400 |
| ttcgtccccc | tcaccccgaa | cgcagacacc | cccgacgccc | gcagccgacc | ctccaccccc | 38460 |
| ggccactcca | cctcatccgc | caacacacga | accgaccac | tcgaccaatc | cacctgcgac | 38520 |
| gacggctcat | ccacatgcaa | cgtccgcggc | aacacccccg | cccgcaacgc | catcaccatc | 38580 |
| ttgatcacac | ccgccacacc | cgcagcagcc | tgcgcatgcc | cgatgttcga | cttcaccgac | 38640 |
| cccaaccaca | ccggcgtgtc | acgggcggcg | tgcccgtag | tggcgagcaa | cgctcgcgcc | 38700 |
| tcgatcggat | caccacgcgt | cgtgcccgtc | ccgtgcccct | ccaccacatc | cacatccgcc | 38760 |
| acagacaacc | ccgcacacgc | caacgcctgc | cgaatcacc | gctgctgcga | cggaccattc | 38820 |
| ggcgccgcta | accatttcga | cgcaccgtcc | tgattcaccg | cactcccccg | caccaccgcc | 38880 |
| aaaacccgat | gaccacgacg | ttcagcctcg | gacagccgct | ccagcagcaa | aatccccacg | 38940 |
| ccctcggaca | tgccgggtgcc | gtcggcagcc | gacgcgtacg | ccttgacccg | gccgtccggc | 39000 |

gacagacccc gctgccgcga gaactccacg aacatgcccc ggggtggacat gaccgtcacg 39060
 cctccggcga gggcgaaagga ggactcaccg gtgcgcagtg actggcaggc gaggtgcagt 39120
 gccaccagcg acgacgagca cgccgtgtcg accgtcaccg cggggccctc gaagccgaag 39180
 gtgtaggcga cgcgtccgga caggatgctt ccgcgttgc cgttgcccag gtagccggcc 39240
 aggtcgtcgg ggaccgagag cagacgggtc gcgtagtccct gggacatgag gccggcgaaag 39300
 acgcccgtcc ggctgccgcg caacgtggcg gggctgatgc ccgccgctc caacgcctcc 39360
 caggacacct ccagcatcaa ccgctgctgc ggatccatcg ccaacgcctc acgcggactg 39420
 atcccgaaaa accccgcata gaactccgcc gcaccctcca ggaaaccgcc ccggcgcgta 39480
 tacgacgaac ccgccgccc cggctccgga tcatagaaag cctccacgtc ccaaccccg 39540
 tcgaccggaa actccccac cgcataccga ccgcagcaa tcaactcca gaaatcctcc 39600
 gccgactcca cccccccg aaacacggcac gccatcccca caattgcaat cggctcctgc 39660
 tcgcccgaat caatctgctg aagtcgacgc cgcacattga ggagatcggc agtaacgcgc 39720
 ttgagatagt cgcggagctt ttcctcgta gccatggacc ggtctcctcg acaagagaaa 39780
 tcggaaatta aaaaacacgc atgggactct cacaggctag agcgacgaga gcagacaaa 39840
 taccctaga taccacgac ccctgatgct cgatgaatgc cgctatagct agggggtatg 39900
 gcgccagaca tg 39912

<210> 4

<211> 60

<212> DNA

<213> *Streptomyces avermitilis*

<400> 4

ccatggaccg gtctcctcga caagagaaat cggaattaa aaaacacgca tgggactctc 60

<210> 5

<211> 3274

<212> DNA

<213> *Streptomyces avermitilis*

<400> 5

accggtcacc cggatttcca ttcgggtgttg cagcacgcga cccactgcgc atccactctg 60
 tgaattgtgg accgccatcc ggggcacgga tgtctccagg aaggaaactcc ttcaccctcg 120
 cgaacaccac ctcagaatcc cagatcatc agttaatcat caaagtcagc gaccttgaca 180
 ctaccccgcc caccagggca aattcataac actgaccatc acctctgatg ctgatcaacc 240
 cagcccgcac ggccgcgacc gcttttgctc aagcaatcga aatccccgag acacgctttc 300
 ttggaaaaag gagaaataag aacatcatgc agggagtttc ctgtctgcac cccctcggga 360
 aaccagaaga actcacgctc gtcgaccggg aaacacagtt ccgcgcgctg cggctggccc 420
 ttaccgaatg cgcggccggc acggtgaaac tgctcgtcgc cgagggcgga atgggtgtg 480
 gaaagagtac gttcctgggc gaggcactgc acaccgcgc cgcctcggc ttcgccgtcc 540
 tgcgtgccgc cgggcttccc gcggaccacc ggcaaccctt cggcgtactg cagcaactgc 600
 tgaacgaccc cgcgcccgag gacaccgcc gcaccgccgt ccgccccatg ccggtgcaac 660
 acgtccgcgg cgcctcgaa cgcctcgcc cggcgcccc gctggcgatc ggcatcgacg 720
 acgtacagga cgcggaccgg gactcgctgc actgtctgat gcgcctcacc cgcactccc 780
 ccacctcgcg gatcctgctg ctgtgcaccg ccctggcggt cagtcgggcc gccgaccgg 840
 tactegaagc cgagctgatg cgtcagaccg ccttcgaacg catcacgctg gactgcctgt 900
 ccctggacgg agtgaccggg ctggtctcgg accgctgcgc gcggcccacg gcgccccgc 960
 cggcggacta ctgcctgacc gtcaccgggg gcaaccgcgt gctgctgcgg gccctgctcg 1020
 aagagcacag cgaggccgac gccccctcgg caccgcgcc ggcgagccc tccgcgctgc 1080
 actccccgc gcaggccgcc ccgcgcgcc cggctcgtcg cggccgcttc taccagtccg 1140
 tactggcctg cctgtcccgc acggagacgg cgatcaggca gacggccggc gccctcgccg 1200
 tcctcggcgg gcgtgcgcgc gccgacctgc tccccaaact gctcggcgcg agtcccgcgt 1260
 cggtcacccg ggggtgcgt gcgctggagg cgacggggct gaccacctcc ggccgtttcc 1320
 ggcacccggg ggccgaggcc gccgcgctcg acgcactgga cccgagccgc cgtgccacc 1380
 tgcaccgcc agcggcgggc ctgcagcacc acgacggcgc ggcgcgcggg gacgtcgccc 1440
 gccaccttct cgcggccgc catgcggcgg gccctgggc ggtgtccgtg ctgcgtgacg 1500

| | | | | | | |
|------------|-------------|-------------|-------------|-------------|------------|------|
| ccgccgagca | gtcgtctggcg | caggacgacg | tggcgctcgcc | ggctctctg | ctggaactcg | 1560 |
| cctacggggc | ctgtgtccgg | gaacgggaac | gtccggagat | caggatcagg | ctcgccgccc | 1620 |
| ctttcgggcg | caccaacatc | gcggtggcgg | aagagcacct | cggcgacctg | gtcgccacct | 1680 |
| tgcgggaagg | agaattgacc | ggccatcaga | cggctttact | cgctccctctg | ctcgtcaacc | 1740 |
| acggccgcct | cggcgaagcg | cgggagggcg | tggaccggct | caacgccgcc | gacgacgcgc | 1800 |
| gcggcctgtg | cgcggacggc | ggcttcccga | tggccgctcc | gtggccgctcg | accgcacacc | 1860 |
| tcgcccacag | ccgcgatccc | gccgcgcgcc | gcgatcccgg | caccgcgcgc | gatcccgcgc | 1920 |
| acaagccggt | cctgccccgg | cagtccgggtg | ccccgcagcc | ccggccggag | gacggccgtg | 1980 |
| gccagcagcc | gacagcggcc | ttgtggggccc | tggccggaaa | cggcaccagc | gaggcggccg | 2040 |
| cacacgccc | ggaacaggta | ctgcggtcct | ccccgctcac | cgacagcacc | ctcgtgctcc | 2100 |
| tgggtgaacg | cgtgcggatc | ctcgcccgc | cggcccggtg | cgacaccgcg | gacatctggg | 2160 |
| gccaccgcct | gctcggcgag | gccaccgcgc | cggttgtgct | cggctggcag | gcgcacctcc | 2220 |
| tggcggtgcg | ggccgaactc | tcgctgtgcc | gtggcctgct | cggcgacgcc | aaggagtgcg | 2280 |
| cccagcgcgc | actgacacac | gtaccggggc | acagccgcag | cgtcttcgcg | ggcggtccgc | 2340 |
| tggcctgcca | ggctctcgcc | tgcaccgcga | tgggacgcta | cgacgaagcc | acgcaactgc | 2400 |
| tcagccatcc | ggttcccagag | gcgctgttcc | acagtgtgta | cggcctgggg | tacctgcggg | 2460 |
| cccggggcca | tttccacctg | gcatgaacct | gcctgcccgc | cggcgtccgc | gacttcctca | 2520 |
| ccgccggccg | gggtggcgcg | gagtggggac | tggaccatcc | gggtgctgctg | ccctggcgta | 2580 |
| cggacgcgcg | ggaggcggtc | ctccggctcg | gggaaacgaa | gagggccgac | caactcctca | 2640 |
| ccgaacagct | cgtctccccg | cacagcggca | accggtacgt | ccgcggcacc | gcgctgcgcc | 2700 |
| tgcggggcca | gaccgcggcg | ccggcggaac | ggctccggct | gctgagcgag | gcggtcagtg | 2760 |
| acctccagag | ctccggcgac | cgcctggcgc | tggcccgcgc | actggccgat | ctcgggcgcg | 2820 |
| cgtatcacag | cgggaacgag | cccgtacggg | cgagcgccac | ggtcggccgc | gcctggcagc | 2880 |
| tggccaagga | gtgcggagcc | caggccctgt | gcgacagcat | cctgcccagt | cgcggcacca | 2940 |
| aggaccgggg | gcccagcgga | agggcgggcg | cgaccgaggc | cctgctgagc | gagtcggaga | 3000 |
| tgcgagtcgc | gacactggcg | gcgggcggca | acaccaaccg | tgagatcgcc | ggccggctct | 3060 |
| gcgtcacctg | cagcacgggtc | gaacagcatc | tgacgcgggt | ctaccgcaaa | ctgaacatca | 3120 |
| cccgcgcgag | ggagctgccg | acccgtctgc | gacacctcgc | ggaccaggcc | aactgaccac | 3180 |
| gggagggggg | gcgtcccggc | gcagctgtgc | ctgtcttcgc | cctcacgaca | tggcgggcgc | 3240 |
| gatgcacagc | ccccactcg | catccaccaa | ctga | | | 3274 |

<210> 6

<211> 11041

<212> DNA

<213> Streptomyces avermitilis

<400> 6

| | | | | | | |
|------------|-------------|------------|------------|-------------|------------|------|
| ctgcagccgg | cccgaccccc | caccgcgcgc | ccccgacgcc | tcttccaaaa | tcacatgcgc | 60 |
| attcgtccca | ctcaccgccg | acgcagacac | ccccgcacgc | cgcagccgac | cctccacccc | 120 |
| cggccactcc | acctcatccg | ccaacacacg | aaccgaccca | ctcgaccaat | ccacctgcga | 180 |
| cgacggctca | tccacatgca | acgtccgcgg | caacaccccc | gcccgcgaacg | ccatcaccat | 240 |
| cttgatcaca | cccgccacac | ccgcagcagc | ctgcgcgatg | ccgatgttcg | acttcaccga | 300 |
| ccccaaacc | accggcggtg | caccggcccc | ctgcccgtac | gtggcgagca | acgcctgcgc | 360 |
| ctcgatcgga | tcacccagcg | tcgtgcccgt | cccgtgcccc | tccaccacat | ccacatccgc | 420 |
| cacagacaac | cccgcacacg | ccaacgcctg | ccgaatcacc | cgtgctgctg | acggaccatt | 480 |
| cggcgccgct | aaccatttcg | acgcaccgtc | ctgattcacc | gcactcccc | gcaccaccgc | 540 |
| caaaacccga | tgaccacgac | gttcagcctc | ggacagccgc | tccagcagca | aaatccccac | 600 |
| gccctcggac | atgccgggtg | cgtcggcagc | cgacgcgtac | gccttgccac | ggccgtcccg | 660 |
| cgacagaccc | cgtgcccgcg | agaactccac | gaacatgccc | ggggtggaca | tgaccgtcac | 720 |
| gcctccggcg | agggcggaagg | aggactcacc | ggtgcgcagt | gactggcagg | cgaggtgcag | 780 |
| tgccaccagc | gacgacgagc | acgcctgtgc | gaccgtcacc | gcggggccct | cgaagccgaa | 840 |
| gggtgtaggc | acgcgtccgg | acaggatgct | tcccgcgttg | ccgttgccca | ggtagccggc | 900 |
| caggctcgtc | gggaccgaga | gcagacgggt | cgcgtagtcc | tgggacatga | ggccggcgaa | 960 |
| gacgcccgtc | cggctgccgc | gcaacgtggc | ggggtcgatg | ccgcgccgct | ccaacgcctc | 1020 |
| ccaggacacc | tccagcatca | accgctgctg | cggatccatc | gccaacgcct | cacgcggact | 1080 |
| gatcccga | aaacccgc | cgaactccgc | cgcacccctc | aggaacccgc | cccggcgctg | 1140 |
| atagcagcaa | cccgcccgc | ccggctccgg | atcatagaaa | gcctccacgt | cccaacccgc | 1200 |

| | | | | | | |
|------------|-------------|------------|-------------|-------------|-------------|------|
| gtcgaccgga | aactccccca | ccgcatcccc | acccgacgca | atcaactccc | agaaatccctc | 1260 |
| cgccgactcc | acaccccccg | gaaaacggca | cgccatcccc | acaattgcaa | tcgggtccctg | 1320 |
| ctcgcccgat | tcaatctgct | gaagtcgacg | ccgcacattg | aggagatcgg | cagtaacgcg | 1380 |
| cttgagatag | tcgcgagct | tttcctcggt | agccatggac | cggtctcctc | gacaagagaa | 1440 |
| atcggaatt | aaaaaacacg | catgggactc | tcacaggcta | gagcgacgag | agcagcacia | 1500 |
| atacccttag | ataccccaga | cccctgatgc | tcgatgaatg | ccgctatagc | taggggggtat | 1560 |
| ggcgccagac | atgaattcac | agcgtttcgg | cgccggctg | gcgcttgta | caggtgcagg | 1620 |
| cggtggcatc | ggcgggcgga | ccgcctgcgc | tctcgatcg | gccggggcgc | gagtggtgtg | 1680 |
| cgtggaccgg | gacggccgcg | gcgcgggggt | gacggccgac | ctggcccgga | cgccggggcgc | 1740 |
| gcggggcgcc | tggcccgagg | tggccgacgt | gtccgacgga | gcggcgatgg | agcgggtcgc | 1800 |
| cgagcgcgtc | gccgagacgt | acggggtcgt | ggacctgctg | gtgaacaacg | ccggcatcgg | 1860 |
| catggcgggg | cgttttctcg | acacgtccgt | cgaggactgg | cagcgacacc | tgggcgtcaa | 1920 |
| cctctggggg | gtcattcatg | gttgccgcct | catcgccggg | cagatggcgg | agcgcgggca | 1980 |
| ggcggggcac | atcgtgacgg | tggcgtcggc | ggcgcgcttc | cagccgacgc | ggcggtctcc | 2040 |
| cgcgtatgcc | accagcaagg | cgccggtgct | gatgctgagc | gagtgccctg | gcgcggagtt | 2100 |
| cgcggagttc | ggggtcggag | tgagcgtggg | gtgcccgggc | ttcgctccta | cgctgttcgc | 2160 |
| gtcggcgatg | catttcgccc | gtgtgccccg | gtcggagcag | gagcggtctg | ggcggtctgt | 2220 |
| cgccggtcgc | ggatgcagcg | cggagaaggt | ggccgcggcg | gtactgcggt | cggtggcgcg | 2280 |
| cgactcggcc | gtggtgaccg | tgacggcgga | agcgcggtcg | tcacggctga | tgagccgctt | 2340 |
| cacgccacgc | ctgcgcgccc | cggtggcgcg | gatggatccc | ccttcgtagg | gctggcgggg | 2400 |
| atccccctct | tgccttcgaa | catcttcgga | cgatgggcag | tgagagatgt | cagatcattt | 2460 |
| tctcttcatg | agtgcgcctg | tctgggggca | tgtgttcccc | agtctcgccg | tggcgaggga | 2520 |
| gctcgtgcac | cggggccacc | acgtcacctt | tgtgacgggc | gcggaaatgg | ccgatgcggt | 2580 |
| gcgttccgtg | ggcgctgatt | tcctgcggta | cgagtcgcgc | ttcgaggggtg | tcgacatgta | 2640 |
| ccggctgatg | accgaggccg | agccgaacgc | catccccatg | acgctgtacg | acgagggcat | 2700 |
| gtccatggtg | cgttcgggtg | aggagcacgt | cggaaggac | gttcgggacc | tgggtggccta | 2760 |
| cgacatcgcc | acctccctca | acgtgggtcg | tgtcctcgcc | gcctcctgga | gcaggccggc | 2820 |
| catgacggtc | attccccctg | tcgcgtccaa | cgggcgcttc | tcacgatgc | agtcgggtatt | 2880 |
| ggatccggat | tcgctcagg | tcagtgcgc | cgcccgcgcc | ttctcgagc | agatggagtt | 2940 |
| gttcggcctc | ggggcgctgg | tgccgcgcct | cgccggagctg | ctcggttccc | gggtatcac | 3000 |
| ggaaccggtc | gacgatttcc | tttcgggacc | ggaggacttc | aacctggtgt | gtctgccgcg | 3060 |
| cgccttccag | tacgcgggcg | acaccttcga | cgagcggttc | gccttcgtcg | gaccatgtct | 3120 |
| gggtaagcgc | aggggtctgg | gcgagtggac | accaccgggc | agcgggcatc | cagtggtgct | 3180 |
| catctccctc | gggacgtgtg | tcaaccggca | gctgtccttc | ttccgcacgt | tcgtccgggc | 3240 |
| gttcaccgac | gtccccgtgc | acgtcgtgat | ctcgctcggc | aagggggctg | accccgagtt | 3300 |
| gctgcggccg | ctgcgcgcga | atgtcgaggt | gcaccgggtg | gtgcgcgacc | atgcggtgct | 3360 |
| ggagcatgcc | agggctctgg | tcacgcacgg | cggtaccggc | agtgtgatgg | aggcactgca | 3420 |
| cgcagggtgc | ccggtgctcg | tcatgccctt | gtcgcgggac | gcgcaggtga | ccggccggcg | 3480 |
| gatcgccgag | ctggggctgg | gtcgtatggt | gcagccggag | gaggtcacgg | cgacgacgct | 3540 |
| gcgcgggac | gtgctggaca | tcctctccga | tgacgcgatc | acccgacagg | tcaggcagat | 3600 |
| gcagcgggac | acggctgagg | cgggcgcgcc | cctgcgggca | gcggacgaga | ccgagcggtt | 3660 |
| tctgcgcggg | acgcgcgctc | actgaccggc | agctcggggc | gggcgggtgag | tggctccac | 3720 |
| agggttcggg | tctccacgta | ccactgaacg | gtctgtgcca | gccccctctc | gaagggcacg | 3780 |
| cggggcgcg | aaccgagctc | ggcgagatc | ttgctgatgt | ccagcgagta | gcgcgggtcg | 3840 |
| tgccccctgc | ggtcgggtcac | gggttcgacc | atcgaccagt | ccacgccgag | caggtccagg | 3900 |
| agccggggcg | tgagctcacg | gttgacagc | tccgtcccg | ctccgatgtg | gtagatctcg | 3960 |
| ccgggctcgc | cgcgttcggc | gaccagggcg | atgccacggc | agtggctcgt | cacgtgcagc | 4020 |
| cagtcgcgga | cgttttcgcc | gtcgccgtac | aagggcacct | tcgtgccgtt | cagcagatgg | 4080 |
| gtgacgaacc | gcgggatgag | tttctccggg | aactggtggg | ggccgtagtt | gttcgagcat | 4140 |
| cggtgatgta | tcaactgtag | gccgtgcgtg | cggtggaagg | accgggagag | caggtcggag | 4200 |
| gacgccttgg | acgcggagta | gggcgagttc | ggctccagcg | gggcgtcctc | ggtccacgag | 4260 |
| ccggagtcga | tgagaccgta | gacctcgtcc | gtcgagatgt | acacgaagcg | gtccacggcg | 4320 |
| gcgtcgggtg | cggcgcgagg | cagggtgtga | gtgcccaggga | cattggtgcg | tacgaactcg | 4380 |
| gcggcgctcg | ccacggaccg | gtccacgtgt | gactccgcgc | cgaagtggac | caccatgtcg | 4440 |
| gagccgtcca | tcaggtccgc | gaccaagggc | ccgtcgacga | tgtcgccgtg | cacgaagatc | 4500 |
| agggatgggc | ttcccaggac | cggtgcgagg | ttctccaggc | gacccgcgta | ggtcagcttg | 4560 |
| tcgagcacca | cgacctcggc | accggtgaac | gccggatacg | cgcccgctcg | caaccgccgt | 4620 |
| acgaaatggg | aaccgatgaa | accggcgccc | cccgtcacga | gtaggcgcat | cccgggctcc | 4680 |

| | | | | | | |
|-------------|------------|------------|-------------|-------------|------------|------|
| tcaccgcggc | ttccgcccga | atactcatca | gatactcgcc | gtagccggag | ccggccagtt | 4740 |
| cgaccccgcg | cagatagcag | tcgtccgcgt | cgatcagacc | catccggaag | gcgatctcct | 4800 |
| cgagacaggc | gatccgtact | ccttggcgct | tctccaggac | ctgcacatac | tgccccgcgt | 4860 |
| gcacagcgga | gtcgtgcgtc | cccgcacgca | gccaggtgaa | gccccggccc | aggtccacca | 4920 |
| gccggggccc | cccctcggcg | aggtaggccc | tggtgacgtc | ggtgatctcc | agctcgccgc | 4980 |
| gggcccagca | gcggtgccc | cgggccacct | cgatcacgtc | gttgctgtac | aggtacaggc | 5040 |
| ctgtgatcgc | caggttgagc | cggggggcgg | tgggtttctc | ctcgacggac | agcagctttc | 5100 |
| cggaggcgtc | gacctctccg | actccgtacc | gttcgggatac | cgtcaccgcg | tatccgaaca | 5160 |
| acacacagcc | gtcgacatcg | cgggtgtggc | tgcgcagcag | gtgcgaaaag | cccatgccat | 5220 |
| ggaagatgtt | gtccccaagg | acaagggaca | cctgatcctg | accgatgaaa | tcggcgccga | 5280 |
| tgaggaatgc | ctcggcgatt | cctcccggtc | gctgctgcgc | ggcgtagtcg | atgttcagcc | 5340 |
| cgaggcggct | tcggtctccg | agcagtctcc | ggaattgttc | gagatgatcg | ggtgaggaaa | 5400 |
| tcaccaggat | gtcttttatg | ccgccgagca | tcaacacgga | gagcgggtag | tagatcatgg | 5460 |
| gtttgtcgta | gacagggagc | agctgcttgg | aaagggcacg | ggtcaacggg | taaagccgag | 5520 |
| agccggttcc | ccccgcgagc | acgattccct | tcatgtcggg | ctccccgcag | tcgacgttat | 5580 |
| atatctctgc | cgtctgcccg | acggtaccaa | gtggcggaag | acgcaccagg | aattcgagcg | 5640 |
| ccgctagggg | gaagggtcca | agaagatagg | ggccaccaga | tggggcggtt | ttcggtgtgc | 5700 |
| ccgccccggc | cgaccggaat | actgaagagc | atgctgacga | ctgggatgtg | cgaccgaccg | 5760 |
| ctggtcgctg | tactcggagc | ctccggctat | atcgggtcgg | ccgtcgcggc | ggaactcgcc | 5820 |
| cgggtggccg | tcctgttgcg | gctgggtggc | cggcgaccgg | gcgtcgttcc | gccgggcggc | 5880 |
| gccgcggaga | ccgagacgcg | tacggccgac | ctgacggcgg | cgagcgaggt | cgccctcgcc | 5940 |
| gtgacggagc | ccgacgtggt | gatccacctg | gtcgcgcgcc | tcacccaggg | agcggcatgg | 6000 |
| cgggcggcgg | agagcgatcc | ggtggccgag | cgggtgaaag | tcgggggtgat | gcacgacgtc | 6060 |
| gtcgcggccc | tgcggtccgg | gcgcgcgcgc | gggcccgcgc | cgggtggtgt | gttcgcgcgg | 6120 |
| tcggtctacc | aggtgggccc | cccgggtcgg | gtcgacggca | gtgagccgga | cgagcccgtg | 6180 |
| acggccctatg | cccgtcagaa | actcgacgcc | gaacggacgt | tgaagtccgc | cacggtcgag | 6240 |
| ggtgtcctgc | gggggatctc | gctgcggctg | cccaccgtct | acggcgccgg | gccgggcccg | 6300 |
| cagggcaacg | gcgtcgtgca | ggcgatggtg | ctccgggcgc | tcgcccagca | ggccctcacc | 6360 |
| gtgtggaacg | gaagcgtggt | ggagcgtgac | ctggtgcacg | tggaggatgt | cgcgacggcc | 6420 |
| ttcgtgagct | gcctggcgca | cgcggatgcg | ctcgcggggc | ggcactggct | gctcggcagc | 6480 |
| ggtcgtcctg | tgaccgtccc | gcacctcttc | ggtgccatcg | ccgcccggct | gtccgcccgc | 6540 |
| accgggcgcc | ccgcgggtgc | cgtgaccgcg | gtggaccctc | cggcgatggc | gacggcgccg | 6600 |
| gacttccacg | ggaccgtcgt | cgactcctcg | gcgttccgcg | cggtcaccgg | gtggcgcccg | 6660 |
| cggctgtcgc | ttcaggaggg | cctggaccac | atggtggcgg | cttacgtgta | gcgcccgggt | 6720 |
| ggcggccggg | cccgggcggg | gacggcccgc | atccgggtcg | gccgtcacag | cttctcgtcg | 6780 |
| aggccgcggc | tcgcgcggta | ctccggcaac | atgccgcgtc | gcagggcctg | ctggagagtc | 6840 |
| ggcgcgcgcc | ggtcgcgctc | ggagaggatc | ggtgcccgcc | cgagggtggt | gccgaggggc | 6900 |
| agggcgaggt | ccggatcctc | gggcgagagg | gcgtgttcgt | tctgcggaac | gtagccgctc | 6960 |
| gacatcaggt | acaccatcgc | cgtgtcgtct | tcacgcgcca | cgaacgcgtg | cccgaacccg | 7020 |
| atcggcaggt | agacggaaag | gaagcgtctc | tggtcgagga | ggaccgagtc | ccactgcccg | 7080 |
| aaagtccggtg | agccggtgcg | caggtcgagc | acgaagtcca | gggcccgtcc | cggcgagcag | 7140 |
| tggacgtact | tggcctggcc | gggtggtgtc | gcgtgaaagt | gcacgcgcgc | gacgacgccg | 7200 |
| cggcgcgaga | cgtcttgga | ggtctgcgcg | gtgggaaacc | ggtgcccgac | ggcctcgtcg | 7260 |
| aggaccggtt | cctggtaggg | ggtgacgaag | agcccgcgct | cgtcggggaa | gaccgtcggg | 7320 |
| gtgaattcga | cggcgccctc | gacgacgagc | ctccggaccg | tgacaccggc | ggcgggtggc | 7380 |
| cgggcgcccc | cgggcggggc | gggcccgtcg | gcggagctcc | ggcgaggccg | gccaagggtc | 7440 |
| atcgctgcac | tctctctgtc | gtgcgggttg | tcatacgggt | agtcgtacgg | gccggttccg | 7500 |
| gagtcacagc | tcgacggcgc | gggtggtgag | cagggacagc | aggggtgcgg | cctgcacgtt | 7560 |
| cacgtaacgg | ccgtaccgca | gcagctgggt | cagctggccc | ggggtgcacc | agcggatccc | 7620 |
| cgggggcggg | tcgttcggcg | cctggctctc | gtcggcctcg | acgaacaggt | agcgcgcctg | 7680 |
| tcgtgcgaga | aagcgaccgc | cctcctccga | gtggaccgcc | gcgtagcgga | tgcggtcggg | 7740 |
| cgcggcctcc | agcaccaggt | cgaggaagcg | cggcctggcc | ggtcccgtga | ggtgggcgta | 7800 |
| gttgccgagg | gtgtactgga | ccgtcggggc | gagttcgatc | gtgtcgagga | agcccccctc | 7860 |
| gacctgcgg | tgggcgagca | ggtgcggtag | ccgcgcgatac | cgccgggtca | ggaaggcggg | 7920 |
| gatgccgtgg | ccgcacgggt | cgatcagggg | ctgggtccag | gcggcgacct | cccgggttga | 7980 |
| ggcctcgaca | cggaccgcga | ccacacggaa | gtaccgggtc | gcgtggtggg | cgatggactc | 8040 |
| cgcgcccgtg | gtccagccgg | ggatgccggc | caggggcacg | cggcgggcgt | gcacggagtg | 8100 |
| ccgggagcgt | tcggcgccgt | accaggagag | cagttcggcg | tcgctgtgca | gggcccgcgg | 8160 |

ctcgctgaac ggggtgggaa ggcaggcgag gaccgtgctg gcgtccatgt tcaccaggtt 8220
 gtcccgggtgc atcagttcgc cgatctgccc cagtgtcagc cagcggaagt cgtcgtccag 8280
 tgggtacgtcc tcgtcgggtct ccaccacgat gttgcggttg aacttccggt ggaaccaggc 8340
 tccgtgctcg gactggagga cgtcgaccac caccgtggcg cgcggggct gtgtgaagta 8400
 ctcgaggtac ttcacggcgg cgcggcggtg gaccttgggt tagttgctgc gcgtggcctg 8460
 cacgggtgggc gacagctgga ccaggttgat gttgcggggc tccatcttgg cctgcatcag 8520
 gaagtgcagg accccgtcga acttcttggc gaggatgccg aggatgccga tctcgggctg 8580
 gtggatgatg ggctgctgcc attccgggaa gggctgttca ccgcctcgga cgtgcagtcc 8640
 ctccacggag aagaaccggc cgtgcgggtg ggccagattg ccggttccgg ggtgaaacga 8700
 ccaggggtcc atcccgtgga aggggatgcg ctgcagccgg aaccgggtgg ccccgagccg 8760
 ccgcgtccac cagccggtga acgcgtcgag ggcagtcgg cgccggtgtc gccacggcg 8820
 gcggagcggg cgaggcacgc gggcagggcg gcgtcgtgcc gcgcgggtgag cgggtgctggg 8880
 ctcgggtgtgg tcggcatcgg ctcgtacgct catgcacccc acgtcatgta gatcaccggt 8940
 ggctcgcggc cgggcagttg gcgcagttgg gcgtggtcga ggccgaacgc ctgcgtcagc 9000
 gccctggtct ccccgggcca tttgggggtg gtgagttcgt cgaaggcgag gatgctgccc 9060
 ctggtcaggt gcgggtgtgat gacgtccagc agttcgcgcg tggggcggtg gaggtccagg 9120
 tcgaagtagg ccagcgcgat gacggtgtgc ggggtgttccg ccaggtattg gggcaccgtt 9180
 tcgcgtacgt cgccttgga cacaagga cgtgggtgt ggccgtaggg ttcgttcgcc 9240
 tcgtgcgcgg cgagcacctg ccgcaggtgc tccacttcgc cgtccggcac ggcgaaccgc 9300
 ccagggaccg cgtggtgct gacctcgtcc gcctcgtcga tgcggggaa gccggtgaac 9360
 gtgtcgaagc cgatgacgcg gcgcagcgag ttgtacggct catagatgct gcgcagcgcg 9420
 gtcagcgtgg cgaggtgccg tccgtgcaga acgcccgaact ccatgatgac gccggggact 9480
 tccggcagca tgcggtacag cgcgtccatg gagagcaggt cggcgagctg gttgcgcgcg 9540
 atgtagacgg acaggttgtc gatcaggtac ttcggcgggg tcgggctgtc gacgaggagc 9600
 ttggtcagct gtcgcggggc agcgcgttcc tgctcggact cgtgcggcac gatccgggga 9660
 tcggtgaact cccgctcggc catggaggcc tttcctttca tgggtcggta ccgggcgcgc 9720
 cggacgtgcc ggtcgtaccg ggcgtgccgg cgggcacgac gctgtcgggt caggacagcc 9780
 aggcgtcggg ggcggatccg ccgcggccga cgggggggaa cagctcctcc aggcgggcca 9840
 ggacgggtcc gggcagcggg gtgcgcaggg cgtgcagtcg cccgtccacg tgcgttcgg 9900
 tgccggccc gatgaccagc ccggtcacgc cgggccgcga cagcaccag gccatgccga 9960
 catgggcggg gtcgagggcg tggctccgcg acacgtcctc gtacgcgcgc atggtggtgc 10020
 ggtggtgctc cagggcctcg acggcccggc cctgtgccga cttgaccgcg gtgttctccc 10080
 gcgtcttgcg caggacaccg ccgagcaggc cgccgtgcag tggcgaccag accaggacgc 10140
 cgacaccgta ggcggacgcg gcggggatga cttccagctc ggcgtgtcgg gtcacaggt 10200
 tgtagacgca ctgctcgga gcgagggcca gggcgttgcg ccgcggggc gcctcctggg 10260
 cggaagcgat gtcccagccc gcgaagttgg aggagccgac gtagcgcacc ttgccctgcg 10320
 tgatgagcag gtccatcgcc tgccacacct cgtcccagcc ggcgcggcg tcgatgtgg 10380
 gcagctggtg caggtcgatc cagtcggtgc gcagtcggcg cagcgaggcg tcgcaggcg 10440
 ccacgatatt gcgtacggac agtccgtgat cgttggggcc gctgcccac gccatgccga 10500
 ccttgggtggc cagcaccacc tgctcacgcc gggcgggggc gtcgcgcagc cacctgccga 10560
 tgacctcttc ggtgtacccc ttgtggacgc gccagccgta ggtgttggcg gtgtcgaaca 10620
 ggggtgatgcc ctgagccagg gcgtgatcca tcagtcggcg cgcttcgggc tcctccacc 10680
 gtccgccgat gttgaccgtt ccgagcgcga gtcggctgat cctcagccgg gtcctgccca 10740
 gttcgggtgt gaggggagca ctgctgttgc tgtcggactg gacgggtgcg ggctcggccg 10800
 tcgtaggcat catcgatcag tcgacactcc ctcgtgcgtg agcggcgggc gctcgagcag 10860
 gaccctgacc tgaggcccag gaggctaccg gcgatcatgc gatacaggca gccgctcgat 10920
 ggtgggacac gggctgccgt cgccgggcat gggggttgtc cgggtcgggt 10980
 ccggctgaca gcttcgtgga caccaagttg atccagttga tccactccga aaggcagagg 11040
 c 11041